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The Commonwealth of Massachusetts.

INDUSTRIAL ACCIDENT BOARD.

SECOND ANNUAL REPORT

OF THE

INDUSTRIAL ACCIDENT BOARD,

INCLUDING

STATISTICAL INFORMATION AND TABLES, ESTIMATES OF THE COST OF
INSURANCE, A COMPARISON OF COSTS UNDER DIFFERENT
SCALES OF BENEFITS AND GENERAL INFORMATION OF IMPORTANCE.

JULY 1, 1913, TO JUNE 30, 1914, INCLUSIVE.



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The Commonwealth of Massachusetts.

INDUSTRIAL ACCIDENT BOARD, NEW ALBION BUILDING,
1 BEACON STREET, BOSTON, Jan. 20, 1915.

To the Honorable Senate and House of Representatives.


The Industrial Accident Board has the honor to transmit herewith its second annual report.

Respectfully,

INDUSTRIAL ACCIDENT BOARD,

DUDLEY M. HOLMAN.
DAVID T. DICKINSON.
JOSEPH A. PARKS.
THOMAS F. BOYLE.

ROBERT E. GRANDFIELD, *Secretary.*



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The Commonwealth of Massachusetts.

INDUSTRIAL ACCIDENT BOARD.

SECOND ANNUAL REPORT

OF THE

INDUSTRIAL ACCIDENT BOARD.

INTRODUCTION.

The workmen's compensation idea has attained rapid progress in the United States since the first law became effective in 1911, until now there are 24 States in which this type of legislation is in effect, and many others in which commissions have been appointed to consider such legislation. While the Commonwealth of Massachusetts was not the first State to pass a law of this nature, nevertheless, it may well be considered a pioneer in this very important field of social legislation.

The proof of this assertion lies in the fact that since July 1, 1912, when the Workmen's Compensation Act became effective in Massachusetts, the Industrial Accident Board has repeatedly been called upon to furnish data and information to other industrial accident boards and commissions, State governments contemplating legislation on the subject, insurance departments, various organizations, special commissions, and individuals interested in the development of the problem.

Commendation has been expressed to the Industrial Accident Board, not only on the wealth of its experience, but also on the methods used in administering the act, and upon the establishment of legal definitions and precedents which are of great assistance in crystallizing the principles which underlie the law of providing compensation for industrial injuries.

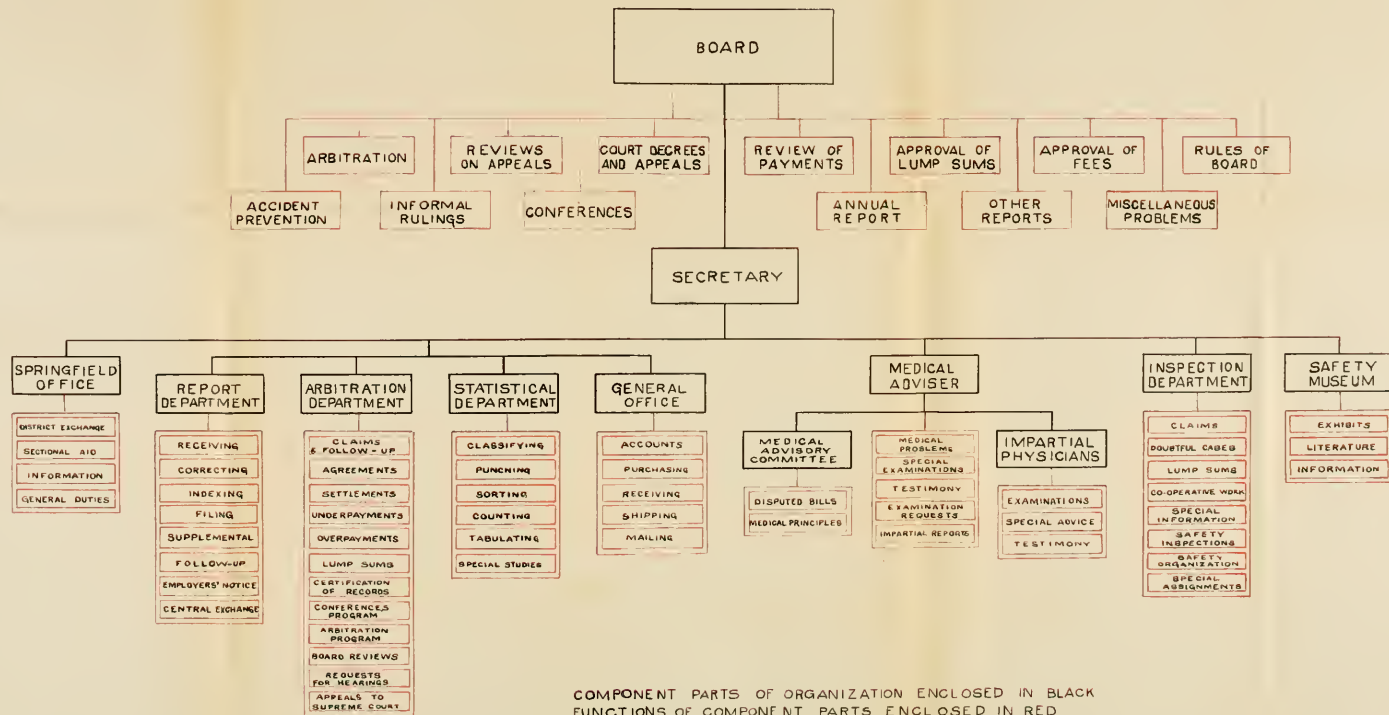
In this, the second annual report, the Industrial Accident Board takes pleasure in presenting the results accomplished in the second year of the act. This experience, taken in conjunction with that for the first year, is extremely valuable, not only as a justification of the Workmen's Compensation Act, but also as a reservoir of knowledge to be drawn upon in formulating new principles, and in developing the law and its administration in a manner which will tend to provide the maximum of justice to the greatest possible number of individuals directly concerned.

Two changes in the personnel of the Board have occurred during the past year: Mr. James B. Carroll, the chairman, and Mr. Edward F. McSweeney, the retiring members, were appointed, respectively, to a justiceship in the Superior Court and to the chairmanship of the Port Directors of Boston. Later Mr. Carroll was made a justice of the Supreme Judicial Court. They were succeeded in order by Mr. Frank J. Donahue and Mr. Thomas F. Boyle, who were, respectively, Secretary of the Commonwealth and chairman of the Civil Service Commission at the time of their appointment.

COMMONWEALTH OF MASSACHUSETTS

INDUSTRIAL ACCIDENT BOARD

ORGANIZATION AND FUNCTIONS





ORGANIZATION AND FUNCTIONS OF THE INDUSTRIAL ACCIDENT BOARD.

The administration of workmen's compensation laws is generally conceded to be most efficient in this country under the Industrial Accident Board method. Obviously, the actual work of one board may differ from that of another, according to the nature of the law to be administered and because of varying local conditions.

The Massachusetts Industrial Accident Board has been in existence since July 1, 1912, and the purpose of this chapter is to describe the present organization and functions of this body as at present developed. Chapter 751, Acts of 1911, with the subsequent amendments thereto, is entitled, "An Act relative to payments to employees for personal injuries received in the course of their employment, and to the prevention of such injuries." Under section 1, Part III. of this act is created the Industrial Accident Board, and under various other sections of the law are defined its duties and powers. By the title of the act the Board's administrative functions may be grouped under two general headings, as follows:—

I. The payment of compensation benefits.

II. The prevention of injuries for which compensation may be claimed.

The two headings so briefly stated above are intended to cover not only the work indicated in a restricted sense, but the entire field of workmen's compensation. In order to do its full duty in connection with the compensation law the Board must, in addition to carrying on the regular routine work, be active in constructive effort for the future development of the law and for the welfare of the public to whom the law applies. For the successful operation of this broad policy there is necessary a large amount of detailed work: the collection, tabulation and analysis of a great mass of data; co-operative propaganda for contact with agencies immediately concerned with the compensation law; and, first and foremost in importance, the establishment of the principle that every person who is entitled to compensation shall receive it promptly, upon the date when it

becomes due. This means that the Board expects, in every non-fatal case, that compensation shall be in the hands of the beneficiary at the end of the third week after the injury occurs, as provided by the statute, and that the dependent of a fatally injured employee shall receive the first week's compensation from the insurer at the end of one week after death, when it becomes due, and regularly each week thereafter. Anything short of this, except in disputed cases, is regarded as inefficient service on the part of the insurer. Next in importance to the prompt payment of benefits to employees and their dependents is the policy of the Board to throw open its doors to the general public and those particularly interested in the workings of the act. Every person who desires information and advice on any question connected with the act is invited and encouraged to confer with the Board. By the practical application of this policy the members and organization keep in close touch with the compensation system, and have a first-hand knowledge and grasp of the law and of the conditions pertinent to its effective administration.

The preceding introduction explains, in a general way, the scope of the work carried on by the Industrial Accident Board. What follows is a description of the physical organization by means of which the act is administered, together with a more detailed exposition regarding the various functions as worked out in actual practice. The accompanying chart has been prepared to assist in visualizing this organization and the relation of the duties assigned thereunder.

As shown by the chart, the Board is so organized as to make its members, as a body, the controlling power, with its secretary as the instrument through which all matters of an executive and administrative nature are made effective. The members of the Board, individually, as chairmen of committees of arbitration, and the Industrial Accident Board, as the reviewing power, determine the policy of the Board in all matters concerning the hearing and decision of cases; and the Board, as the governing body, gives form and substance to the law in its interpretation of the various questions arising thereunder. Under the plan in operation the secretary, as executive officer, is responsible for the

general management of all matters of policy decided upon by the Board, has discretionary power in the conduct of office matters, and in general makes the rulings of the Board effective in connection with all questions which arise under the statute.

The next point to be considered is that which relates to the departments through which the routine and advisory work passes. Under section 18, Part III. of the act every employer is required to report all injuries received by his employees in the course of their employment, and subsequently to make supplemental reports. The report department handles this large mass of material when the report first comes into the office. Each report is corrected, numbered, indexed and filed; and when supplemental reports are received, each is attached to the proper report. In this department, also, are followed up injuries which have occurred but have not been reported within the forty-eight hours fixed by law.

The number of accident reports, alone, received at the office and handled by this department amounts to an average of approximately 325 reports per working day. In this department, also, there is maintained a central exchange by means of which all reports and attached correspondence taken from file and passed through various channels can be traced and located when needed.

In the arbitration department are handled all matters which relate directly to the payment of compensation or the refusal to pay. When an employee makes a formal claim for compensation, notice of such receipt is sent to the insurance company which covers the risk, with a request for information regarding the status of the case. Insurers are encouraged, however, to pay compensation in every case without awaiting the filing of a claim for compensation, and as a result of such encouragement this has become the general custom. When an insurance company and an employee enter into an agreement for the payment of compensation, a copy of such signed agreement is sent to this department for approval. Before passing such agreements a clerk doing this work must check up, on the basis of the accident report, the date of the injury, average wages, and whether the compensation is for total, partial or specified disability. Then,

if approved, notice of such action is sent to the insurer. In compensation cases where disability has ceased the insurance company is required to file a final settlement receipt signed by the employee. This receipt states the total amount paid and the date on which disability terminated. When the department has checked up this receipt with the terms of the agreement and the supplemental report filed by the employer, the matter is approved and the case is closed. Any closed case, however, may be reopened, should there be a recurrence of disability due to the original injury, within the statutory period of five hundred weeks from the date of the injury. The only exception is when all liability is redeemed, in unusual cases, under section 22, Part II. of the act.

The duties of the arbitration department considered up to this point deal altogether with automatic settlements. When a case is disputed, however, and the matter cannot be adjusted informally, either party in interest may request an arbitration hearing. When the department receives a request of this nature the other party concerned is notified that a hearing is to be held in the case, and is asked to name its representative for the committee of arbitration. If there is to be counsel for either side, such persons are also notified. This department then sets a date for a hearing, and keeps every one interested informed of all developments in the case. When either of the parties desires from the Board a review of the findings and decision of a committee of arbitration, a date is set for such review, and subsequently notice of the decision of the Board is sent them. If an appeal is then to be taken to the Supreme Judicial Court, this department furnishes certified copies of the record. A decree, in accordance with the findings of the Board, is issued in due course by the Superior Court, and from this decree the appealing party, by proper motion, takes the case to the highest tribunal.

The next department to be considered is that which handles the Board's statistics. This department has charge of the classification and tabulation of statistics of injuries collected from the reports. For the purpose of doing this work, which involves the use of a voluminous mass of data, the Hollerith tabu-

lating machine is used. The figures and facts to be tabulated are taken from the reports of injuries and punched on special symbol cards; then these cards are run through the sorting-machine to get groups of cards which correspond to the number of cases in a certain desired classification group. The next process is to have these various piles of cards run through an automatic counting machine which registers the number in each pile. When these numbers are all entered in the proper place on the classification sheets, the statistics are then ready for final tabulation and analysis.

Obviously, in carrying on the duties of the Industrial Accident Board there is considerable work in merely running the business itself. This work is handled by the general office department, which has charge of the accounts, purchasing and receiving supplies, shipping documents and reports, mailing and all other general work.

At Springfield there is maintained a branch office of the Industrial Accident Board. This office is not a department in the sense of those just described, but is intended to carry out the general work of the Board on any and all questions which may arise in that district.

At the Boston office, also, the following departments have to do, not exactly with the routine work, but their main function is to keep the Board informed at all times of any questions which come up under the act. The first of these departments to be considered is that which keeps the Board informed and advised on the medical problems which arise under the act. The medical adviser examines all impartial physicians' reports, considers requests for impartial examinations, and then, after analyzing the facts of the case, both as to the cause of the dispute, examinations already made, and other data which he may have in his possession, selects the physician who he thinks may best deal with the particular problem, keeping in mind, of course, the place where the person to be examined resides; also, when a question comes before an arbitration committee or before the full Board, the medical adviser is of great assistance by reason of the information which he can give. In general, any matter which has to do with the medical aspects of the law are sub-

mitted to this department for the purpose of obtaining advice to be used by the Board in its consideration and decision of the cases.

The Board also receives assistance on medical questions by the medical advisory committee. This committee is made up of four physicians, selected by the presidents of the Massachusetts Medical Society and Massachusetts Homœopathic Society, and three who are appointed by the Industrial Accident Board. The main duty of this body is to pass upon doctors' bills, payments of which are disputed by the insurance companies on the ground that they are not reasonable. These questions are decided on an industrial basis, in accordance with the average minimum fee of the district where the physician has his office.

The Board is further aided in passing upon questions of medical fact by impartial physicians who are appointed, under Part III., section 8 of the statute, to examine injured employees in disputed or doubtful cases, and to report to the Board upon questions of incapacity for work; upon the relation of cause and effect between injury and disease, or injury and death; upon the reasonableness and necessity of operations; and upon methods of aiding employees to recover from the effects of their injuries. These and other similar questions all have to do with the just administration of the law and the furnishing of its benefits to those who are fairly entitled to them.

Another internal unit is the inspection department, the main functions of which have to do with the investigation of causes of injuries for which compensation may be claimed. Among the numerous duties discharged by the department under this heading are the investigation of death cases in which there is some degree of doubt as to the connection between the death of an employee and the injury, and the investigation of disputes on such questions as average weekly wages, duration of incapacity for work, facts as to whether an injury actually occurred as alleged, requests for lump-sum payments, requests for further medical attendance beyond the period of two weeks, facts regarding the average minimum medical fee in certain localities, and, in general, complaints of all kinds. Briefly stated, any and all matters that require investigation are looked up and

reported upon by this department, with the end in view that the desire of the Board for speedy payments in every case may be attained.

For the purpose of investigating causes of injuries this department selects various plants throughout the Commonwealth, and has prepared statistical studies to show the experience for a given period at these factories or places of business. With these studies as a basis, inspectors visit factories and take up with the management the problems of accident prevention. Following the inspections which are made, reports are submitted with recommendations for safeguarding machinery and danger points in the plant. The attempt, also, is made in all cases to get the consent of the management to take up actively the organization of safety committees. In this latter work the fact is made known that any Board member or inspector is available, when requested, to help in the formation of such committees.

This department, also, is from time to time given special assignments on various problems which arise in administering the act.

Another department of the Board devoted exclusively to the matter of accident prevention is the safety museum. This museum has a growing collection of exhibits on various types of safety devices. There is kept, and catalogued, literature on different phases of the subject; also there is an information file to show where safety devices may be procured, and data on approximate costs. This museum is intended to be of assistance to employers in carrying out recommendations made by the Board, and also to make available to those interested devices which the employer himself may desire to install.

The preceding exposition has dealt with the machinery by means of which the Industrial Accident Board carries on its work of administering the Workmen's Compensation Act. What follows is a description and explanation of the principal provisions of the act, also matters upon which the Board or its members act directly.

The first matter to be taken up along this line is the procedure by means of which disputed claims are adjusted. In

accordance with Part III., sections 5 and 6 of the act, provision is made for the formation of arbitration committees whose duty it is to hear the facts in disputed cases and to render decisions thereon. One member of the Board acts as chairman of the committee, and each of the interested parties names a representative.

As ruled by the Board on the basis of the legal provision, arbitration is held under the following circumstances:—

1. In every disputed case where there has been no adjustment of compensation, the course of procedure is for the parties to come before a committee of arbitration.

2. If, where an agreement is signed and compensation is to cover a certain fixed period, and after that period is ended there is a dispute as to the recurrence or continuance of disability, the procedure then is to come before a committee of arbitration.

When a decision of an arbitration committee is made, unless a claim for review is filed within seven days, such decision is enforceable under section 11, Part III., through the Superior Court.

A claim for review from a decision of a committee of arbitration is provided for under section 10, Part III. of the act. Such cases are heard by the Board, usually for the purpose of determining whether the decision rendered is in accordance with the evidence and the provisions of the law. If the facts are insufficient, the Board may refer the matter back to the committee of arbitration for further findings of fact, and may uphold or revise the opinion given. This process, in which the wisdom of the full Board is applied to a case, is a very effective and important check in the administration of the act.

Under section 11, Part III., still another safeguard is provided in the right to appeal from a review hearing for the purpose of obtaining a decision from the Supreme Judicial Court. This right also gives the Board an opportunity to obtain an interpretation of the law in relation to certain questions which are raised by the parties at interest.

The next important provision of the act to be considered is that which deals with the review of weekly payments under

section 12, Part III. This provision is applied when a committee of arbitration has once acted on a case and decided that a man's compensation should continue indefinitely, and later a dispute arises between the parties as to whether the compensation should be "increased, diminished or ended." In such cases the matter is reviewed by the full Board, and a decision is rendered on the facts presented.

Another important matter upon which the Board acts directly arises in applications for a lump-sum settlement. By section 22, Part II. of the act every settlement for liability by the payment of a lump sum must first have the approval of the full Board.

Section 13, Part III. of the act gives to the Board the power of approval over the fees of physicians and attorneys. In the matter of physicians' fees much of this work can be performed on the basis of standards determined by the Board. The approval of attorneys' fees is usually brought up in cases of lump-sum settlements and in arbitration cases.

Another important provision which must be acted on by the Board directly is under section 3, Part III. of the act, in which the power is given to "make rules not inconsistent with this act for carrying out the provisions of the act." By means of this section the Board is able to adopt simple working rules which facilitate the administration of the act. The Board's policy in this matter has been to have as few and simple rules as possible, in order to avoid confusion and to expedite settlements.

Also, the full Board has done very important work in the matter of making informal rulings. Oftentimes certain cases arise in which there is no established precedent under the Massachusetts act, and in these cases the request is often made that the full Board give a ruling as to a probable decision on the facts presented. Such rulings, which are made without prejudice to the rights of either party to a formal hearing, often lead to adjustments which otherwise could not be attained, except in the way prescribed under the act for settling disputed cases. Such rulings are asked not only in actual cases, but sometimes information is desired in hypothetical cases, where the opinion of the Industrial Accident Board will assist an employer, for

example, in arriving at a decision as to whether or not he should insure under the act. Without going further into detail, this subject may be dismissed by stating that the number of questions which have been passed upon in this way is voluminous.

Yet another very important function of the Board is that by means of which cases are frequently settled by informal conferences. In such cases not the full Board but different Board members meet with the persons interested in a dispute, and attempt to bring them together for the purpose of making some amicable settlement which is in accordance with the law. Much valuable work has been done in this way in cases where the point in dispute, as a rule, has been caused either by a misunderstanding of the law, or lack of knowledge of certain pertinent facts developed either by the Board or one of the interested persons.

Members of the Board act, in every instance, as chairmen of committees of arbitration formed under the statute. In that capacity they are engaged in hearing cases every day, except the afternoon of Wednesday and all day Thursday of each week, at which time the full Board hears and decides cases on review. Each member of the Board has a conference day weekly at the office, when he does not hear cases formally, except in cases of emergency or necessity. His time during the entire day set aside for conference purposes is filled with engagements pertinent to the administration of the law. In addition to the persons with appointments there is always a waiting list to take advantage of the open-door policy of the Board, through which persons may receive the benefit of the member's aid in the adjustment or solving of cases and problems under the act.

The matters so far considered, on which the Board members act directly, have dealt with compensation problems. Another very important problem is that of accident prevention. This work of the Board falls into four groups.

1. Work in which the Board acts directly through its members in their personal consideration of the problems arising under the statute.

2. Work in which the Board acts through the agency of its

inspectors, who, on the basis of a special study showing the causes of injuries, the wage loss and other valuable data, make an investigation of the conditions which result in injuries, and interest employers in the removal of such conditions.

3. Work in which the Board acts through the co-operation of the inspectors of insurance companies.

4. Work in which the Board acts through the dissemination of literature.

Under chapter 813, Acts of 1913, the Industrial Accident Board is charged with the duty of making investigations of the causes of injuries for which compensation may be claimed; and by reason of the power thus given the Board, appreciable progress has been made in procuring the voluntary co-operation of employers of labor in removing the cause of preventable injuries.

To encourage the organization of safety committees the Board has placed its members at the disposal of any employer, and will, on request, make engagements for the formation of such committees by the members.

The functions of the Industrial Accident Board described up to this point have dealt almost entirely with the direct problems of the act. In addition to this work the Board members must and do devote a certain amount of time to the consideration of problems allied to the act. Also, because of the opportunity for being familiar with all phases of the law, and with the conditions attendant upon the operation of the law, the Board members stand in a position where they can be of great service to all who are directly interested in workmen's compensation.

Employers, employees, insurance companies, physicians, attorneys and the public are directly affected, not only by the law as at present developed, but also have a vital interest in the future development of the law. Likewise, other State governments are highly interested in procuring any light on a type of legislation which is comparatively in its infancy in the United States.

Recognizing these facts, the Industrial Accident Board aims to keep in touch with the very latest experience on this subject, and to attack and solve all complex questions which arise in

the course of the work. When expedient, conferences are held with representative men or bodies for the purpose of exchanging views and thereby getting down to a common basis of understanding.

The facts set down in this chapter have been offered for whatever general interest they may have, and also to show in detail the machinery by means of which the Workmen's Compensation Act is administered in Massachusetts. The chart epitomizes the organization and related duties of the Board. The text explains in greater detail the points indicated in this chart.

Below is appended a brief summary of the number of reports of injuries received at the office of the Industrial Accident Board from July 1, 1912, through June 30, 1914. This table also shows other facts regarding the automatic payment of compensation and the number of disputed cases handled.

Reports received:—

July 1, 1912, to June 30, 1913,	. . . .	90,631	
July 1, 1913, to June 30, 1914,	. . . .	98,729	
		<hr/>	189,360

Claims received:—

July 1, 1912, to June 30, 1913,	. . . .	4,569	
July 1, 1913, to June 30, 1914,	. . . .	5,699	
		<hr/>	10,268

Agreements approved:—

July 1, 1912, to June 30, 1913,	. . . .	9,832	
July 1, 1913, to June 30, 1914,	. . . .	13,395	
		<hr/>	23,227

Settlement receipts approved:—

July 1, 1912, to June 30, 1913,	. . . .	6,332	
July 1, 1913, to June 30, 1914,	. . . .	14,241	
		<hr/>	20,573

Total number of requests for arbitration received:—

July 1, 1912, to Nov. 30, 1913,	. . . .	584	
Dec. 1, 1913, to Nov. 30, 1914,	. . . .	799	
		<hr/>	1,383

Total number of cases heard by Board on review under section 7, Part III.:—

July 1, 1912, to Nov. 30, 1913,	. . . .	56	
Dec. 1, 1913, to Nov. 30, 1914,	. . . .	149	
		<hr/>	205

Total number of cases heard by Board on review under section 12, Part III.: —

July 1, 1912, to Nov. 30, 1913,	6
Dec. 1, 1913, to Nov. 30, 1914,	22
	—

28

Total number of cases appealed to Supreme Judicial Court: —

July 1, 1912, to Nov. 30, 1913,	26
Dec. 1, 1913, to Nov. 30, 1914,	38
	—

64

Decisions by the Supreme Judicial Court affirming the findings of the Industrial Accident Board from July 1, 1912, to Nov. 30, 1914,

28

Decisions reversing findings of the Board, July 1, 1912, to Nov. 30, 1914,

6

Number of cases before Supreme Judicial Court, and not yet acted upon,

30

THE SECOND YEAR OF THE ACT.

With the completion of the second year under the Massachusetts Workmen's Compensation Act a good deal of interesting and valuable information has been made available both for the purpose of disclosing the operation of the law for the particular year, and also to make facts regarding the workings of the law in the previous year more definite and reliable.

At the outset the Board was confronted with the difficult task of administering the act, with very little, in the way of adequate experience, by which to be guided. On the basis of the first four months' study embodied in a letter to the Governor, and the experience of the first and second years of the act, the problem has been gradually worked out in the direction of increasing efficiency. The consensus of opinion held by those familiar with the subject shows that the different phases of workmen's compensation become exceedingly complex in the first three or four years following the enactment of such legislation in a community. In view of this fact the returns for a year, and the possibility for comparisons with the previous year or preceding years, are invaluable for meeting new conditions.

In the period July 1, 1913, to June 30, 1914, there were 96,891 cases of fatal and non-fatal injuries which "arose out of and in the course of employment." The increase in the total number of cases over the previous year is 7.4 per cent.

Of this number, 96,382 cases were non-fatal and 509 cases were fatal. In the year July 1, 1912, to June 30, 1913, there were 89,694 cases of non-fatal injuries and 474 fatal cases. The increase over these figures for the year 1913-14 in the two groups are, respectively, 7.4 and 7.3 per cent.

In addition to the 509 fatalities mentioned above there were 85 fatal cases reported which were not subject in any respect to the provisions of the Workmen's Compensation Act.

Other facts pertaining to the 509 persons fatally injured are shown below.

The number insured under the act was 371; the number not so insured was 138; and in these cases the only method for

recovering damages lay in a suit at common law, in which event the three common-law defenses formerly available for employers would be removed.

Expressed in terms of per cents., 72 per cent. were insured as against 61 per cent. in the previous year.

In 87 cases there were no dependents; in 331 cases there were 942 persons totally dependent; and in the remaining 91 cases there were left 144 persons partially dependent.

Regarding marital condition, 170 of the persons who died as a result of injury were single; 32 were widowers; 2 were divorced; and 305 were married. These figures show that in 60 per cent. of the cases the injured were married at the time of death, and this rate is the same as the corresponding figure of 60 per cent. established in the first year's experience.

As shown above, there were 96,382 non-fatal cases of injury.

In 75,325 cases, or .78 per cent. of the total, incapacity extended for two weeks or less. Of this number, 41,269, or 43 per cent., were cases in which the employees were incapacitated for one day or less. In 1912-13 the corresponding per cents. were 76 per cent. for cases whose duration was two weeks or less, and 41 per cent. for cases where incapacity was for one day or less.

In 9,221 cases, or 10 per cent., incapacity extended from two to four weeks. The corresponding proportion in 1912-13 was 12 per cent.

In 7,065 cases, or 7 per cent., incapacity extended four to eight weeks, as against 7 per cent. for the previous year.

In 2,549 cases, or 3 per cent., incapacity extended eight to thirteen weeks. In 1912-13 the ratio was 3 per cent.

In 1,491 cases, or 1 per cent., incapacity extended thirteen weeks to six months, and the proportion in 1912-13 was also 1 per cent.

In 731 cases, or $\frac{7}{10}$ of 1 per cent., incapacity extended over six months. In 1912-13 the relative number of cases in this group was $\frac{3}{10}$ of 1 per cent.

Based on mean duration of total disability, the aggregate number of days lost as a result of industrial injuries in the period July 1, 1913, to June 30, 1914, was 1,336,966. For

the first two years of the act the total number of days lost was 2,493,753, or approximately 8,000 working years.

The aggregate number of weeks lost was 190,995 in the year 1913-14.

Taking the days lost as a basis, 4,456 persons were constantly disabled for a full year.

The average duration of total disability per reported case is 13.87 days, approximately a day higher than for the year preceding. Eliminating those cases in which incapacity extended for less than one complete day, the average number of days lost per case, based on the remaining total, is 23.88.

In 1912-13 the employees of Massachusetts lost in wages, as a result of industrial injuries, \$2,965,225. In 1913-14 this loss amounted to \$3,172,440, — an increase of \$207,215, or approximately an additional loss of \$700 per day.

Of the total loss of wages in the year 1913-14, \$2,760,023 was a loss suffered by insured employees, and \$412,417 by employees who were not insured.

Returns from insurance companies show that the estimated payments for medical and hospital attention, compensation for disability and dependency, together with outstanding losses payable to dependents and to those with continuing disabilities, amounted to \$2,621,752.91. This amount does not include any of the expenses of insurance administration. The increase in payments and estimates on outstanding losses over the first year of the act amounts to 56 per cent.

Based on these figures the average cost per case for the year 1913-14 was \$27.05.

BENEFITS AND COSTS UNDER THE ACT.

The development of compensation insurance as a substitute for employers' liability in the Commonwealth of Massachusetts for the past two years has shown some highly gratifying and interesting results. As stated in the first annual report of the Industrial Accident Board, there was collected in premiums for employers' liability insurance, in Massachusetts in 1911, approximately \$1,680,280; and the net recovery by employees, after the different expenses of litigation were deducted, was estimated to be about \$400,000. This amount represented about one-quarter of the payments and estimates on outstanding losses received by employees under the benefits of the Workmen's Compensation Act for the first year.

The extent to which the system of employers' liability has been superseded by that of workmen's compensation is shown by a comparison between the amounts of business done in employers' liability in the years 1911 and 1913. The figures of the Massachusetts Insurance Department give as the total amount of the liability business in Massachusetts for the year 1913 on all classes of risks, both public and private, \$2,739,-076.68 for the total net premiums, and \$1,450,114.27 for the total losses paid. The proportion of these amounts applicable strictly to employers' liability business is not given in the report of the Insurance Department; but by using a percentage factor which shows the ratio between employers' liability and all types of liability on a known part of the totals given above, a fair estimate is possible. On this basis 7.77 per cent. of the total premiums were collected under employers' liability, and of the total losses paid 22 per cent. were on account of employers' liability. By applying these factors the result is that approximately \$212,826 and \$322,215 were, respectively, the amount of premiums collected and the amount of losses paid by insurance companies in employers' liability.

As compared with the year 1911, before the Workmen's Compensation Act became effective, these figures show an estimated decrease in premiums of \$1,467,454, or 87 per cent. Likewise there is an indicated decrease in losses paid which

amounts to \$384,074, or 54 per cent. The important figure which discloses the real decrease in employers' liability is that on premiums, which shows that as the old policies expire there is comparatively no new business being written in this line. The reduction in the amount of losses is less pronounced, owing to the fact that this cost is chargeable mainly to policies written in preceding years. Consequently, the effect of a decrease in the amount of new business is reflected more gradually in the losses paid.

Taking into account the cost of recovering damages under employers' liability, to say nothing of the delay and worry incident thereto, it is safe to say that the net awards to employees in the year 1913 would not amount to more than \$180,000, — a decrease from the amount estimated for 1911 of \$220,000.

Under the Workmen's Compensation Act, in the period July 1, 1913, to June 30, 1914, the paid and estimated losses on account of medical attention, disability and dependency compensation amounted to \$2,621,752.91. These figures as compared with those for the year 1912-13 show that the wage earners of Massachusetts received in benefits \$944,372.09 more than in the first year of the act. This increase is due to the greater number of employees insured under the act; to increasing efficiency in administration; to an increased number of agreements in proportion to the number of injuries; and in general to the better understanding, on all sides, of the scope and real intent of the law. Also, there is the possibility that the estimates made by insurance companies have been computed on a different basis.

The next point to be considered is that which deals with the cost of insurance both to the employee and to the employer. Preliminary to considering this question and the incidence of cost there is necessary a certain amount of explanation regarding the figures to be used in this connection.

The report of the Insurance Department for the year 1913 gives the experience of companies doing workmen's compensation business in Massachusetts for the eighteen months from July 1, 1912, to Dec. 31, 1913, on terminated policies. These figures do not include business on unexpired policies; and also

in the beginning of the act there naturally were policies which had run for varying lengths of time. At the present writing information which will coincide with the Board's fiscal year is not available. With a few explanations, however, these figures may be safely used for the purpose of making the desired approximations. As tested out, the experience for eighteen months above mentioned should be equivalent to about twelve months' business.

Based on these returns the amount of pay roll which represents the earnings of insured employees, after allowing a reasonable margin for error, is at least \$450,000,000, and the corresponding premium cost based on this pay roll is at least \$4,590,000.

In the year July 1, 1913, to June 30, 1914, the employees of Massachusetts lost in wages \$3,172,441; there was paid out in benefits \$2,621,752.91. In addition to the suffering and other intangible results of injuries, in the aggregate there was a money loss to employees, contributed as their share of the cost of industrial injuries, of at least \$1,000,000.

The cost of providing compensation benefits borne in the original instance by the employers, but ultimately intended to be shifted to the consumer, amounted to \$4,590,000. On a pay roll of \$450,000,000 this premium represents an average rate of approximately 1 per cent. of the pay roll. This average rate would probably be somewhat lower if it were possible to eliminate entirely the effect of the higher rates previously in force and which were reduced at various times.

The value of manufactured products reported by the Massachusetts Bureau of Statistics for the year 1913 was \$1,658,728,363. The total amount of wages earned was \$351,299,706. By reducing this figure to the probable amount covered by insurance, and estimating the premium in accordance with the average rate, it is found that in manufacturing industries the premiums would aggregate at least \$3,000,000.

According to the returns for 1913, therefore, the cost of insurance shifted to the consumer of manufactured product would amount to only 18 cents per \$100 purchase. This includes both the cost of losses and the cost of insurance administration.

Based on the eighteen months' experience cited in a previous paragraph there is shown a loss cost which equals 33 per cent. of the premium. By an adjustment, however, made to give weight to the rate in force in April, 1914, this loss ratio is nearer 45 per cent. of the premiums, and in view of the increased benefits under the law, and the normal increase to be expected in the early years of the act in the payment of benefits, the proportion of premiums paid out for medical attention and compensation may be expected to approach 50 per cent.

In this chapter the fact is shown that the compensation law in Massachusetts has practically eliminated the operation of employers' liability. Employees and their dependents have received, in the year July 1, 1913, to June 30, 1914, benefits which aggregate more than ten times the amount paid out under employers' liability in the year 1913. Injuries which under the old system would not entitle an employee to recover a cent in damages have been recognized as being due purely to industrial causes, and in this way much distress has been prevented. The enormous waste of time and money involved in litigation, and the ensuing spirit of distrust and the lack of harmony between employers and employees, have also been greatly reduced.

With the proper shifting of the cost of compensation upon the entire community the actual per capita cost is almost negligible.

As knowledge of the law becomes more widespread, and with more adequate provisions for the payment of benefits, a greater proportion of the premiums will go towards the cost of losses, and the insurance companies' expense of administration if kept down within reasonable limits should obviate the necessity for increasing insurance rates as a whole.

STATISTICAL DIGEST.

The Workmen's Compensation Act has been in effect in Massachusetts since July 1, 1912. In the annual report issued by the Industrial Accident Board for the period July 1, 1912, to June 30, 1913, there were printed eighteen detailed statistical tables to show the accident experience for that period. The information therein contained has proved to be of considerable value to the Board in its constructive administration of the law, and the hope exists that others interested in this very important problem have been assisted likewise.

Similar tables which cover the experience for the period July 1, 1913, to June 30, 1914, are printed in this report. A few changes have been made in the methods of tabulating the statistics, mostly in the direction of a finer analysis of wage payments and of duration of total disability. The rearrangement, however, will not vitiate for comparative purposes the figures for the first year of the act, since all that is necessary is to take the sum of the items in those groups which coincide with the groups in use in the first year. The Board is constantly aiming to make its figures of greater value as experience dictates to be necessary in meeting new problems or changed conditions which affect old problems.

The accident experience which is shown in the Appendix of the report is summarized in this chapter in order that the general results for the second year of the act may be more readily understood.

The reports of accidents here tabulated are based on the following totals for the year July 1, 1913, to June 30, 1914: —

Accident Magnitude and Insurance.

ACCIDENTS.	Totals.	Insured.	Not Insured.	Stood on Common Law.
Non-fatal,	96,382	83,797	12,585	270
Fatal,	509	371	138	3

Analysis of this table shows that of the employees who received injuries of a non-fatal nature 87 per cent. were insured under the act; and of those fatally injured 73 per cent. were insured. The corresponding percentage rates for the previous year were 81 and 61 per cent., respectively.

INDUSTRIES.

In this section is shown the distribution of non-fatal and fatal accidents according to industries.

In the case of non-fatal accidents the industries have been condensed into 24 principal groups, although the table gives 120 distinct classifications.

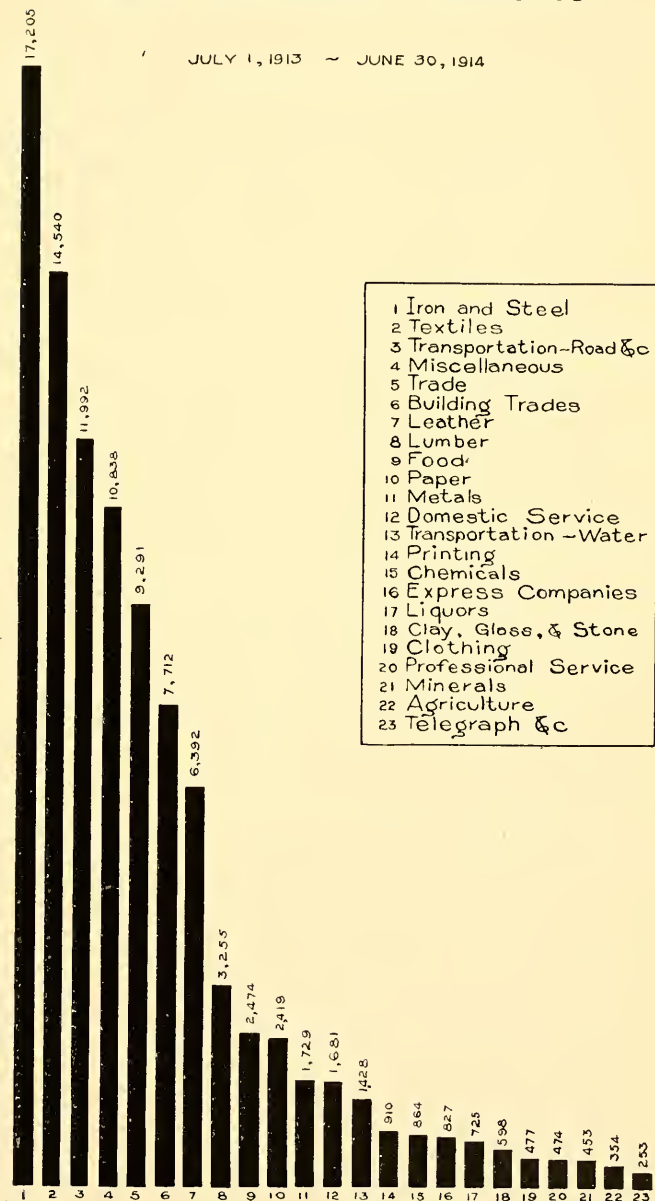
Incidence of Non-fatal Accidents by Industries.

INDUSTRY.	Number of Cases.
Iron and steel,	17,176
Textiles,	14,508
Road, street and bridge transportation,	11,818
Trade,	9,246
Building trades,	7,638
Leather and its finished products,	6,376
Lumber and its remanufacture,	3,246
Food and kindred products,	2,465
Paper,	2,408
Metal and metal products,	1,727
Domestic and personal service,	1,673
Water transportation,	1,411
Printing and bookbinding,	908
Chemical and allied products,	854
Express companies,	821
Liquor and beverages,	720
Clay, glass and stone products,	595
Clothing,	477
Professional service,	472
Extraction of minerals,	450
Agriculture, forestry, animal husbandry and ice harvesting,	348
Post, telephone and telegraph,	248
Other persons in transportation,	26
Fifteen other industries,	10,771
Total,	96,382

CLASSIFICATION BY INDUSTRIES

TOTAL REPORTED ACCIDENTS

JULY 1, 1913 ~ JUNE 30, 1914



Massachusetts Industrial Accident Board

This table shows a frequency range in the classifications, between 26 accidents and 17,176. The order of incidence is practically the same as that shown for the preceding year.

The distribution of fatal accidents by industries is summarized in the following table:—

Incidence of Fatal Accidents by Industries.

INDUSTRY.	Number of Cases.
Road, street and bridge transportation,	174
Building trades,	74
Trade,	45
Textiles,	32
Iron and steel,	29
Water transportation,	17
Leather and its finished products,	16
Chemical and allied products,	10
Paper,	11
Food and kindred products,	9
Lumber and its remanufacture,	9
Domestic and personal service,	8
Express companies,	6
Agriculture, forestry, etc.,	6
Liquors and beverages,	5
Telephone and telegraph,	5
Extraction of minerals,	3
Metal and metal products,	2
Printing and bookbinding,	2
Clay, glass and stone products,	3
Professional service,	2
Miscellaneous industries,	41
Total,	509

As shown above, practically one-third of the fatal accidents occurred in the course of employment included under the heading of “road, street and bridge transportation.” Of the number shown — 174 — 79 deaths are chargeable to steam railroads and 60 to the construction and maintenance of streets, roads, etc. A large number of deaths due to injury also occurred in the building trades, with a list of 74.

NUMBER.

The next table is a study which shows for twenty-five of the principal industries in the Commonwealth the number of accidents per 1,000 employees.

*Number of Accidents per 1,000 Employees for Twenty-five Selected
Branches of Industry.*

INDUSTRY.	Number per 1,000.
Automobile factories,	287
Foundries and metal working,	232
Slaughter and packing houses,	189
Electrical supplies,	168
Box makers (wood),	137
Rubber factories,	129
Printing and publishing,	120
Tanneries,	119
Bakeries,	105
Pianos and organs,	104
Furniture,	101
Car and railroad shops,	100
Paper and pulp mills,	97
Box makers (paper),	78
Candy,	68
Woolen and worsted mills,	68
Cotton mills,	67
Marble and stone cutters,	59
Dyeing and finishing textiles,	58
Carpet mills,	56
Makers of blank books, etc.,	55
Boots and shoes,	54
Jewelry factories,	54
Knitting mills,	44
Clothing makers,	22

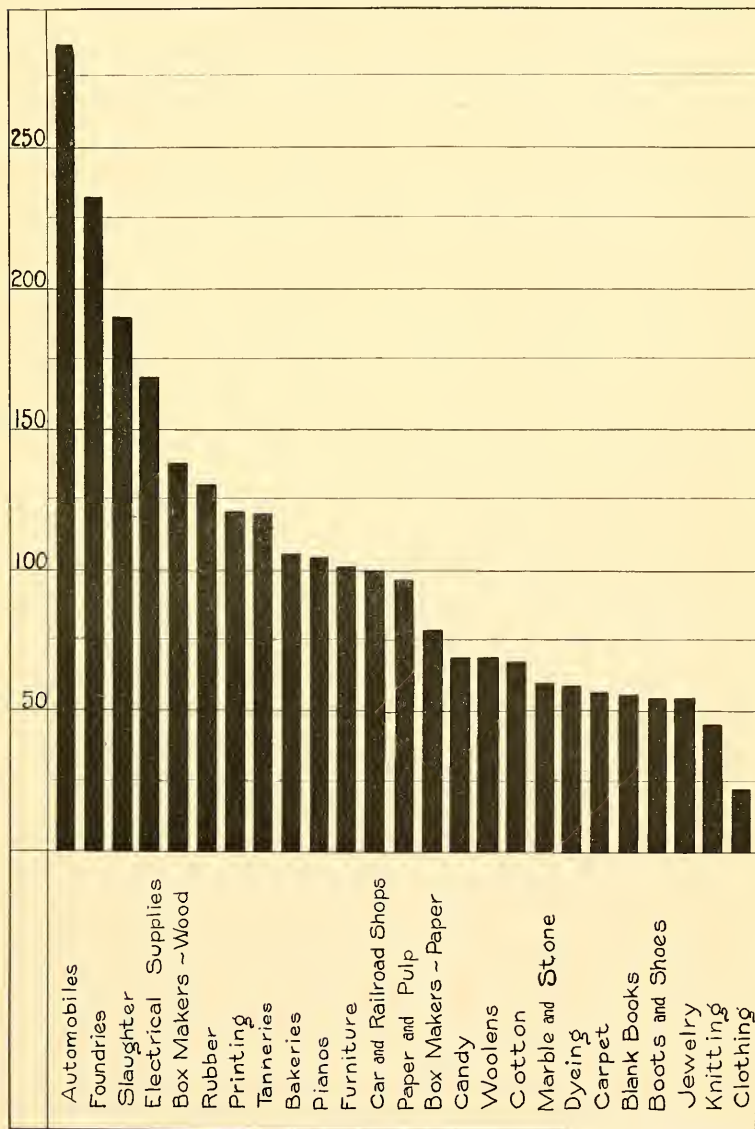
The figures given above illustrate in a general way only the hazard of the industries considered from the angle of accident frequency. The seriousness of the injuries is not here shown. Furthermore, the number of employees is based on the average for a year as compiled by the Massachusetts Bureau of Statistics. The factor of the number of hours worked is not available for the purpose of weighing the element of exposure.

CAUSES.

The causes of non-fatal and fatal accidents are summarized in the tables given below:—

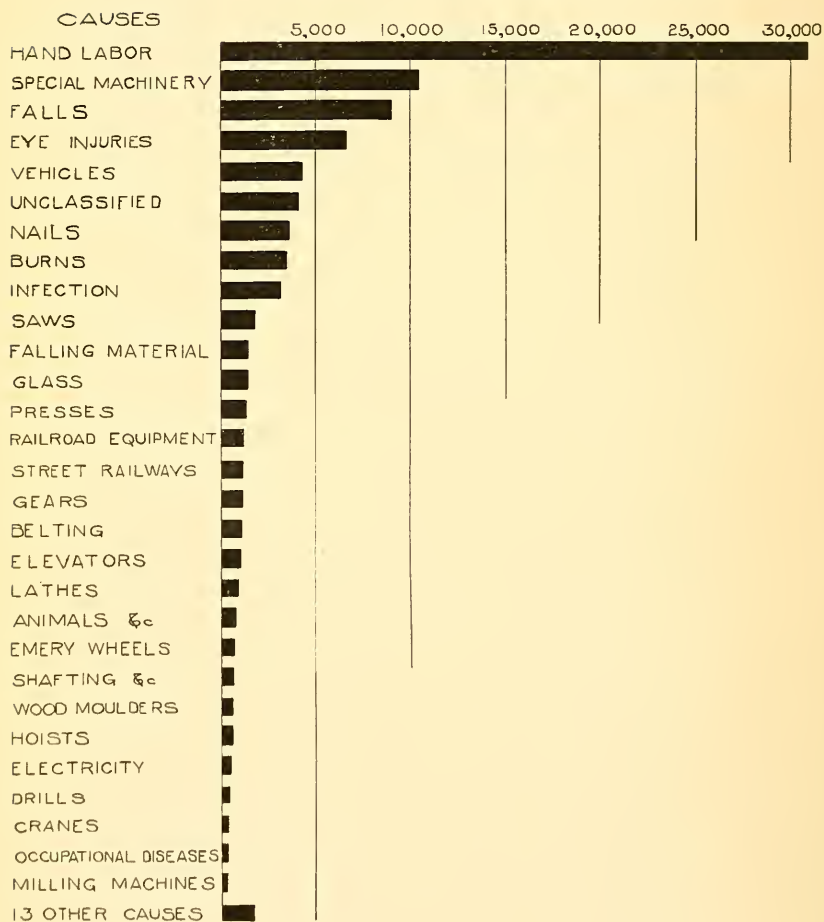
NUMBER OF ACCIDENTS PER 1000 EMPLOYEES IN 25 SELECTED INDUSTRIES

JULY 1, 1913 ~ JUNE 30, 1914



A CLASSIFICATION BY CAUSES OF NON-FATAL ACCIDENTS

JULY 1, 1913—JUNE 30, 1914



Causes of Non-fatal Accidents.

CAUSES.	Number of Cases.
Hand labor,	30,973
Machinery peculiar to special industries,	10,444
Falls,	8,955
Eye injuries,	6,563
Vehicles,	4,422
Nails,	3,657
Burns,	3,524
Infection from trivial cuts, etc.,	3,175
Saws,	1,603
Glass,	1,478
Falling material from overhead,	1,502
Presses,	1,419
Street railways,	1,284
Railroad equipment,	1,345
Gears,	1,228
Belting,	1,140
Elevators,	1,078
Lathes,	938
Emery wheels,	852
Animals, etc.,	866
Wood molders, etc.,	708
Hoists,	704
Shafting, set screws,	721
Electricity,	486
Drills,	454
Cranes,	434
Occupational diseases,	354
Milling machines,	319
Explosions (other than boilers),	252
Excavating,	269
Calenders,	205
Engines,	164
Asphyxiation, drowning, etc.,	110
Planers,	75
Eight other causes,	588
Miscellaneous unclassified,	4,093
Total,	96,382

Analysis of these accidents into three groups of causes, as follows, hand labor, machinery and all other, shows that 32 per cent. were caused by hand labor, 25 per cent. were caused by machinery, and 43 per cent. were due to all other causes.

The next table gives a list of the causes of fatal accidents.

Causes of Fatal Accidents.

CAUSES.	Number of Cases.
Falls,	101
Railroad equipment,	86
Vehicles,	48
Elevators,	30
Electricity,	28
Hand labor,	24
Infection from trivial cuts,	23
Asphyxiation, drowning, etc.,	25
Street railways,	18
Burns,	15
Explosions (other than boiler),	14
Hoists,	16
Shafting, set screws,	11
Machinery peculiar to special industries,	11
Occupational diseases,	10
Cranes,	7
Falling material from overhead,	6
Saws,	5
Excavating,	5
Belting,	3
Animals, insects, etc.,	3
Presses,	2
Boiler explosions,	1
Gears,	1
Five other causes,	6
Miscellaneous unclassified,	10
Total,	509

Analysis of these accidents into the three groups of causes worked out above shows the following percentage distribution: hand labor, 5 per cent.; machinery, 17 per cent.; all other, 78 per cent.

Based on the total number of fatal accidents, 17 per cent. were caused by railroad equipment and 20 per cent. by falls. These percentages are included in the figure of 78 per cent. given above.

TIME OF OCCURRENCE.

Facts regarding the time of day and the day of the week at which fatal and non-fatal accidents occurred are shown below:—

Frequency of Accidents by Hours of the Day.

	MORNING.											
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Non-fatal, .	205	287	303	320	345	492	2,220	6,376	9,203	12,940	12,204	6,459
Fatal, . .	6	1	5	3	8	3	20	31	26	51	56	36

	AFTERNOON.											
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Non-fatal, .	3,357	7,852	10,440	9,776	7,224	2,638	786	867	727	655	476	230
Fatal, . .	26	41	46	46	39	18	9	9	5	7	10	7

The tabulation given above shows that the greatest number of accidents fall in the morning between 10 and 11 o'clock; and in the afternoon the peak is between 3 and 4 o'clock. This result agrees with the experience of the previous year, and appears to represent a fairly well crystallized law.

The frequency of accidents by days of the week is indicated in the next table.

Frequency of Accidents by Days of the Week.

DAY OF WEEK.	Number of Non-fatal Cases.	Number of Fatal Cases.
Monday,	16,463	99
Tuesday,	16,691	86
Wednesday,	16,601	86
Thursday,	16,044	72
Friday,	16,653	80
Saturday,	12,360	68
Sunday,	1,570	18
Total,	96,382	509

This study shows a fairly steady frequency of accidents for each day of the week except for Saturday and Sunday, when there is a diminution in the number of accidents, as would naturally be expected.

SEX.

The total of 96,382 non-fatal accidents divided by sex is as follows: —

Male,	87,613
Female,	8,769
Total,	96,382

From the above, the fact is shown that 91 per cent. of the non-fatal injuries occurred among men.

In fatal cases 503, or 99 per cent., were men, and 6 cases, or 1 per cent., were women.

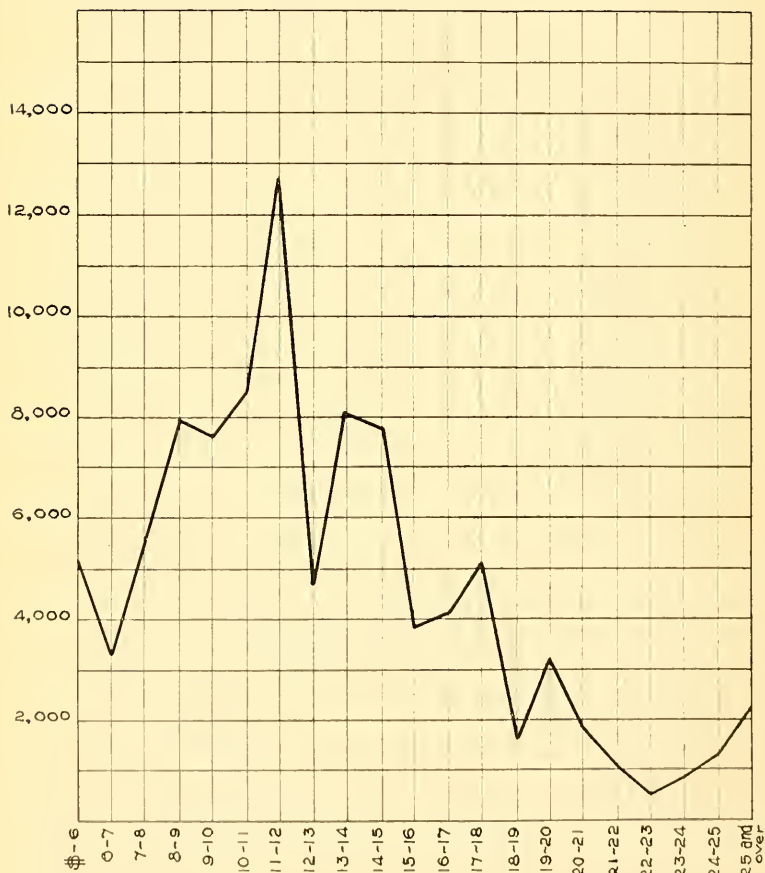
WAGES.

The distribution of accidents according to the wages of persons injured has been made with greater detail than was the case for the preceding year. For comparative purposes, however, the same groups as used for the first year of the act may easily be obtained by combining the figures given below.

WAGE GROUP DISTRIBUTION

TOTAL REPORTED ACCIDENTS

JULY 1, 1913 ~ JUNE 30, 1914



Below are the tables which show the average rates of wages of injured persons in non-fatal and fatal cases, respectively: —

Wages of those not fatally injured.

WAGE GROUPS.	Number of Cases.	WAGE GROUPS.	Number of Cases.
\$6 and under,	5,171	\$16 01-\$17 00,	4,085
6 01-\$7 00,	3,268	17 01- 18 00,	5,029
7 01- 8 00,	5,468	18 01- 19 00,	1,612
8 01- 9 00,	7,941	19 01- 20 00,	3,194
9 01-10 00,	7,569	20 01- 21 00,	1,807
10 01-11 00,	8,471	21 01- 22 00,	1,022
11 01-12 00,	12,668	22 01- 23 00,	496
12 01-13 00,	4,670	23 01- 24 00,	842
13 01-14 00,	8,075	24 01- 25 00,	1,272
14 01-15 00,	7,782	Over \$25,	2,148
15 01-16 00,	3,792	Total,	96,382

Wages of those fatally injured.

WAGE GROUPS.	Number of Cases.	WAGE GROUPS.	Number of Cases.
\$6 and under,	13	\$16 01-\$17 00,	22
6 01-\$7 00,	7	17 01- 18 00,	37
7 01- 8 00,	13	18 01- 19 00,	10
8 01- 9 00,	23	19 01- 20 00,	13
9 01-10 00,	32	20 01- 21 00,	16
10 01-11 00,	42	21 01- 22 00,	10
11 01-12 00,	78	22 01- 23 00,	5
12 01-13 00,	20	23 01- 24 00,	9
13 01-14 00,	40	24 01- 25 00,	11
14 01-15 00,	59	25 01- 35 00,	24
15 01-16 00,	25	Total,	509

AGE.

The distribution of persons not fatally injured and of those fatally injured is arranged in groups, as follows:—

Distribution of Accidents by Age Groups.

AGE.	Number of Fatal Cases.	Number of Non-fatal Cases.
Under 16,	3	1,525
16-20,	35	14,210
21-29,	107	35,678
30-39,	113	23,054
40-49,	119	13,546
50-59,	81	6,114
60 and over,	51	2,255
Total,	509	96,382

As shown above, the greatest number of accidents of a non-fatal nature were received by persons between twenty-one and twenty-nine years of age; and the next highest number of cases fell in the group thirty to thirty-nine years. In the case of fatal accidents the largest number of cases occurred between the ages of forty and forty-nine.

DURATION OF TOTAL DISABILITY.

On the question of duration of disability, a finer analysis than that for the previous year has been made, in order that the figures may be of greater practical value.

The table given below shows this information in condensed form only:—

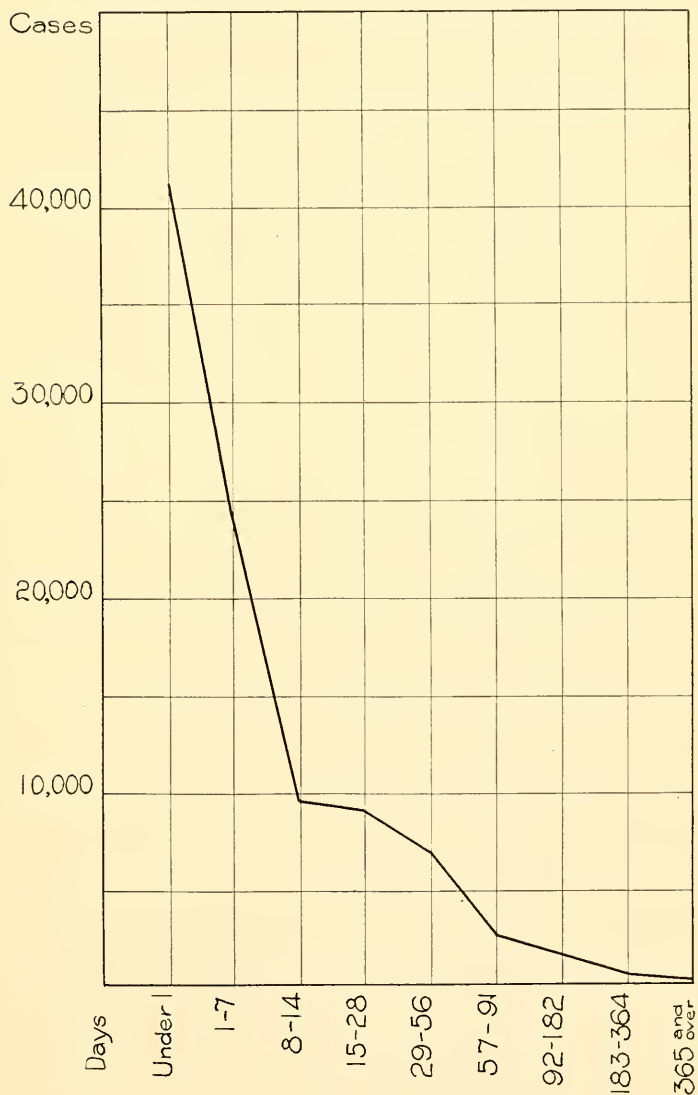
Non-fatal Accidents.

GROUPS.	Number of Cases.	GROUPS.	Number of Cases.
1 week and under,	24,301	13 weeks to 6 months,	1,491
1 to 2 weeks,	9,755	6 months to 51 weeks,	438
2 to 4 weeks,	9,221	52 weeks and over,	293
4 to 8 weeks,	7,065	Disability less than 1 day,	41,269
8 to 13 weeks,	2,549	Total,	96,382

DURATION OF TOTAL DISABILITY

NON-FATAL INJURIES

JULY 1, 1913 ~ JUNE 30, 1914.



Of these accidents, the fact should be noted that in 41,269 cases there was no disability beyond the day on which the injury occurred.

SPECIFIED INJURIES.

The frequency of specified injuries for which additional compensation is payable under the act are listed below: —

Specified Injuries.

INJURY.	Number of Cases.	Additional Compensation per Case (Weeks).
Both eyes and one hand lost,	1	150
Both feet lost,	2	100
One hand and one foot lost,	1	
One eye and one hand lost,	1	
One hand and two or more fingers lost,	2	75
One foot and two or more toes lost,	2	
One eye lost,	77	50
One hand lost,	38	
One foot lost,	22	
Two or more fingers on each hand lost,	1	
Two or more fingers on one hand, one finger on other hand, lost,	1	37
Two or more fingers lost,	112	25
Two or more toes lost,	9	
One finger lost,	804	12
One toe lost,	42	
Total,	1,115	

CONJUGAL CONDITION AND DEPENDENCY IN FATAL CASES.

The conjugal condition of those fatally injured is shown in the following table: —

Conjugal Condition in Fatal Cases.

CONDITION.	Number of Cases.	CONDITION.	Number of Cases.
Single,	170	Divorced,	2
Married,	305	Total,	509
Widowers,	32		

Facts regarding dependency are summarized in the following table: —

Dependency.

	Number of Dependents.	Number of Cases.
Total,	942	331
Partial,	144	91
None,	-	87

In these figures the actual number of dependents is shown, together with the number of cases in each type of dependency.

The number of total dependents, 942, is based on 331 separate death cases in which dependency was total. Likewise the 144 cases of partial dependency are based on 91 death cases in which dependency was partial.

PAYMENTS BY INSURANCE COMPANIES.

Returns for the year July 1, 1913, to June 30, 1914, made by insurance companies have been tabulated and are summarized below: —

Total medical cost (paid and estimated),	\$556,250 45
Non-fatal accidents (paid and estimated),	1,486,796 71
Fatal accidents (paid and estimated),	578,705 75
Total,	\$2,621,752 91

These figures show paid and estimated outstanding losses on account of medical and hospital treatment, and for compensation in fatal and non-fatal cases.

COMPENSATION BENEFITS UNDER THE MASSACHUSETTS WORKMEN'S COMPENSATION ACT.

The enactment of legislation on workmen's compensation during the last few years in the United States indicates that the importance of this subject has been recognized. An excellent beginning has been made, but a great deal of diligent effort is still necessary to bring the law up to a standard which will in practice enable the carrying out of the principles at the foundation of this type of legislation. Industrial accidents contribute heavily to the evil of social waste. The number of accidents can be reduced by preventive measures, but can never be entirely eliminated, so that the vital problem is to reduce this waste by bringing injured persons back as near as possible to their former earning capacity. Provision for compensation benefits should be sufficient to keep a man and his family from being subject to charity during this process of rehabilitation. The loss involved by accidents can never be fully regained. The employee's wages, the employer's production, and the joint loss to the community can be only partially recovered. The problem, therefore, in constructive compensation legislation is to get a balance that will give the maximum of justice to the greatest number. In furtherance of the principle of rehabilitation, payments should be so graded that serious injuries will not be discriminated against by the overpayment of benefits in cases which are less serious in nature.

Adequate provision for disabilities which are permanent in quality presents a problem which is difficult, but one which must be solved. This phase of the law is a matter of serious interest to all the States which have workmen's compensation acts, from the east across the country to the Pacific coast. All these States have been visited by members of the Massachusetts Industrial Accident Board, and there is unanimous dissatisfaction on the part of the members of accident commissions in these States with the law on permanent disabilities. The Commonwealth of Massachusetts has a good law from the point of view of administration, but its provisions for permanent disabilities should be improved.

The amended law which went into effect Oct. 1, 1914, provides for an increase in the rate of compensation from 50 to 66 $\frac{2}{3}$ per cent. of the loss in average weekly wages; also the period of payments in cases of death and disability, either total or partial, has been extended not to exceed five hundred weeks, with the maximum amount of compensation which may be paid set at \$4,000.

For the purpose of determining the adequacy of the provisions in the present Massachusetts law, a comparison is made in this chapter with the Boynton Workmen's Compensation, Insurance and Safety Act, which went into effect in California, Jan. 1, 1914.

The California law is chosen for this purpose because this law is the only example to be found in the United States of an attempt to construct a schedule of benefits in which weight is given to the varying effects of different kinds of injury on persons of different ages and engaged in different kinds of occupation.

The difficulties of arriving at a proper basis of award lie in the varying effects which injuries have on different persons. Age, occupation, education, general health, courage, ambition, honesty, the co-operation of employers, together with the type of injury, are all factors which influence a person's ability to return to work at the former wage level, a lower level, or not at all. These factors also go towards determining the length of time that a person will be disabled. In the California schedule the attempt is made to measure the more important of these factors, *i.e.*, injury, age, and occupation.

In the analysis which follows, the fact should be clearly understood that there is no attempt made to pass judgment upon the efficiency of the California law. That work can be done only after considerable experience has been accumulated in that State. This chapter is intended primarily to show the actual benefit provisions under the Massachusetts law, and then to call attention to the California law by indicating its main provisions in connection with those in operation in this State.

The examples given below have been taken from the more detailed analysis shown later on in the chapter, for the purpose

of indicating briefly the probable awards which would be made in California in a few actual cases of permanent disabilities taken from Massachusetts experience.

A foreman whose work required his attendance at gas-producer furnaces lost the sight of both eyes as a result of his work. This man was forty-seven years of age, and earned \$19.04 per week. In Massachusetts the compensation for this disability amounts to \$5,000. In California the total amount, including the pension, would be approximately \$10,000.

An operator of an automatic screw machine lost the sight of one eye. His age was thirty-five years and his wages \$15 per week. Disability extended for almost nine weeks, when the man was able to resume work at his former wages. In addition to the compensation during the period of disability there was an additional payment of fifty weeks, making a total payment, in Massachusetts, of \$587. In California payments would be about \$945 in a period of ninety-seven weeks.

A fleshing machine operator met with an accident which necessitated the amputation of the minor arm between the shoulder and elbow. This man's age was sixty-five years at the time of the accident and his wages \$18 per week. After a total disability of six and four-sevenths weeks he returned to work of a supervisory nature at \$12 per week, and is now being paid compensation on the basis of partial disability. Total payments in Massachusetts will be about \$2,500. In California the amount would be \$3,000.

A man operating a hair-picking machine suffered a loss at the proximal joints of the index and middle fingers of the major hand. His age was twenty-eight years, and wages \$9 per week. Disability lasted for eight weeks, but payments, including additional compensation for twenty-five weeks, amounted to \$198. In California the provisions for compensation would allow \$304 in a period of fifty-two weeks.

Proceeding to the more detailed study of the Massachusetts law and to the comparison with the California law, the summary inserted at this point has been prepared to show the compensation provisions under each act. Analysis of this table is

made more simple by taking like groups of disability for the common units, as follows:—

TABULAR COMPARISON OF BENEFITS.

CALIFORNIA.	MASSACHUSETTS.
<i>Death.</i> —65 per cent. of weekly wages; 240 weeks; maximum, \$20.83 per week; minimum, \$4.17 per week; total payments range from \$1,000 to \$5,000.	<i>Death.</i> —66⅔ per cent. of weekly wages; 500 weeks; maximum, \$10 per week; minimum, \$4 per week; total payments range from \$2,000 to \$4,000.
<i>Temporary Total Disability.</i> —65 per cent. of weekly wages; not to exceed 240 weeks; maximum, \$20.83 per week; minimum, \$4.17 per week; maximum total payments, \$5,000.	<i>Total Disability, Temporary or Permanent.</i> —66⅔ per cent. of weekly wages; not to exceed 500 weeks; maximum, \$10 per week; minimum, \$4 per week; maximum total payments, \$4,000.
<i>Temporary Partial Disability.</i> —65 per cent. loss in wages; not to exceed 240 weeks; maximum, \$20.83 per week; maximum total payments, \$5,000.	<i>Partial Disability, Temporary or Permanent.</i> —66⅔ per cent. loss in wages; not to exceed 500 weeks; maximum, \$10 per week; maximum total payments, \$4,000.
<i>Permanent Disabilities.</i> —For permanent disabilities compensation is provided, as follows:—	<i>Specified Injuries.</i> —For the following specified injuries additional compensation is provided, as follows:—
(a) For a disability of 69¾ per cent. or less, 65 per cent. of wages for 4 weeks for every 1 per cent. of disability; maximum, \$20.83 per week; minimum, \$4.17 per week; total payments range for a disability of ¼ of 1 per cent. from \$4.17 to \$20.83; for a disability of 69¾ per cent. from \$1,163.43 to \$5,811.57.	(a) <i>Loss of Two Members; Loss of Two Eyes.</i> —66⅔ per cent. of weekly wages; maximum, \$10 per week; minimum, \$4 per week; 100 weeks; total payments range from \$400 to \$1,000.
(b) For a disability of 70 per cent. or more, 65 per cent. of wages for 240 weeks; and thereafter a life pension of 1 per cent. of wages for every 1 per cent. of disability in excess of 60 per cent.; maximum, \$20.83 per week; minimum, \$4.17 per week; total payments for 240 weeks range from \$1,000 to \$5,000. Pension varies.	(b) <i>Loss of One Member; Loss of One Eye.</i> —66⅔ per cent. of weekly wages; maximum, \$10 per week; minimum, \$4 per week; 50 weeks; total payments range from \$200 to \$500.
	(c) <i>Loss above Second Joint of Two or More Fingers, etc.</i> —66⅔ per cent. of weekly wages; maximum, \$10 per week; minimum, \$4 per week; 25 weeks; total payments range from \$100 to \$250.
	(d) <i>Loss of at least One Phalange.</i> —66⅔ per cent. of weekly wages; maximum, \$10 per week; minimum, \$4 per week; 12 weeks; total payments range from \$48 to \$120.
<i>Medical treatment for 90 days.</i>	<i>Medical treatment for 2 weeks. Additional treatment at discretion of Board.</i>

A. Death.

(1) *California.*—65 per cent. of wages extends in all cases for 240 weeks. This is equivalent to 156 weeks' full wages, between the wage limits of \$333.33⅓ and \$1,666.66⅔. The resultant weekly compensation limits are \$4.17 and \$20.83; and the resultant total compensation limits are \$1,000 and \$5,000.

(2) *Massachusetts.*—66⅔ per cent. of wages for 500 weeks is equivalent to 333⅓ weeks' full wages. The weekly compensation limits are set at \$4 and \$10; and the upper total com-

pensation limit is fixed at \$4,000. The resultant lower limit for total compensation is \$2,000. In order to compare the unit 333 $\frac{1}{3}$ weeks' full wages with the corresponding unit under (1), and to determine the resultant annual wage limits which operate under this provision, further analysis is necessary.

(a) Considering the \$4,000 maximum compensation limit, 66 $\frac{2}{3}$ per cent. of wages for 500 weeks is equivalent to 333 $\frac{1}{3}$ weeks' full wages only when annual earnings limits are \$312 and \$624, and only in such cases will compensation extend the full 500 weeks.

(b) When the compensation limit of \$10 per week is operative, payments may be made for only 400 weeks. This payment is equivalent to 266 $\frac{2}{3}$ weeks' full wages, in which case the annual earnings upper limit is \$780.

A compression of (a) and (b) shows, on the basis of the range in annual wages, the resultant range in the number of compensation weeks and the equivalent in full weeks' wages.

RANGE OF ANNUAL WAGES.	Number of Compensation Weeks at 66 $\frac{2}{3}$ Per Cent.	Number of Weeks, Full Wages.
\$312 00-\$624 00,	500	333.3
625 25- 780 00,	499-400	332.6-266.6
Over \$780 00,	400	Less than 266.6

A comparison of the benefits in fatal cases under the two laws discloses the following facts: In California all weekly payments extend for the same length of time, — 240 weeks. In Massachusetts the period covered varies from 400 to 500 weeks. In California the minimum amount of compensation payable is \$1,000; in Massachusetts the corresponding amount is \$2,000. The actual annual wage which controls this latter payment is \$312. In California compensation of \$2,000 would require as a basis annual earnings of \$666.66. Using the common unit weeks' wages as reduced by a combination of the amount of weekly compensation and the number of compensation weeks, the following relationship is found to be existent: —

WAGE LIMITS (ANNUAL).	Margin in Terms of Full Weeks' Wages by which Payments are greater or less in Massachusetts on California Unit of 156 Weeks' Full Wages.	WAGE LIMITS (ANNUAL).	Margin in Terms of Full Weeks' Wages by which Payments are greater or less in Massachusetts on California Unit of 156 Weeks' Full Wages.
(a) \$624 00 and less, . . .	+177.3	(e) \$1,040 00-\$1,333 33, . . .	-1
(b) 625 25, . . .	+176.6	(f) 1,341 60- 1,666 66, . . .	-1 to -31.2
(c) 780 00, . . .	+110.6	(g) Over \$1,666 66, . . .	-31.2
(d) 1,040 00, . . .	+ 44.0		

¹ Excess margin decreases to 0 at upper wage limit of group.

From this table the fact is shown that in those cases where wages are \$15 per week or less the compensation benefits in Massachusetts will, on the average, amount in total payments to almost double the benefits provided in California. At \$20 per week Massachusetts' payments will amount to 44 weeks' wages in excess of California payments. In cases where the weekly wage is \$25.64, the number of weeks' full wages payable in compensation will be the same in both States. Where weekly wages exceed this amount the number of full weeks' wages payable in compensation will show in Massachusetts a comparative decrease, until a weekly wage of \$32.05 is reached. This wage is the California upper limit which controls the maximum amount of compensation payable weekly in that State. At this point the excess of weeks' wages in California is 31.2, and this is the margin of difference which will prevail in all cases when weekly wages are more than \$32.05.

For the purpose of noting the relative number of fatal cases in which persons in Massachusetts are affected by these various wage limits which actually control the compensation benefits fixed by statute, the following wage table, based on Massachusetts' experience for the period July 1, 1913, to June 30, 1914, is shown:—

Fatal Cases.

WEEKLY WAGE.	Per Cent. of Cases.	WEEKLY WAGE.	Per Cent. of Cases.
\$12 and under,	40.8	\$26 01- \$33 00,	4.1
12 01-\$15 00,	23.4	Over \$33 00, . . . . .	.3
15 01- 20 00,	21.1		100.0
20 01- 26 00,	10.3		

These figures indicate that 40.8 per cent. of the persons fatally injured in the year July 1, 1913, to June 30, 1914, received wages of \$12 per week or less. This is the upper wage limit at which two-thirds of wages may be paid over a period of 500 weeks and be within the compensation limits of \$10 per week and \$4,000 total payments. In 23.4 per cent. of the cases, or the groups in which wages range from more than \$12 to, and including, \$15, compensation may extend from less than 500 weeks to 400 weeks. At the \$15 limit the compensation would equal \$10 per week for 400 weeks. In 35.8 per cent. of the cases wages are in excess of the maximum wage limit. Consequently, in these cases no compensation is paid for that loss of wages which exceeds \$15 per week. In addition there is the loss of $33\frac{1}{3}$ per cent. of wages which operates in all cases where wages range from \$6 to \$15 per week. From another point of view, dependents of persons whose wages were \$15 per week receive \$10 per week for 400 weeks, which amounts to \$4,000. On the basis of weekly payments extending for 500 weeks the compensation rate in such cases is $53\frac{1}{3}$ per cent. of average weekly earnings. On this same basis the dependents of a person whose earnings were \$20 per week receive compensation at the rate of 40 per cent. of average weekly wages. As the amount of wages in excess of \$624 per year increases, the net rate of weekly wages payable as compensation decreases. This fact is of importance in considering questions of policy regarding the protection of standards of living. Although the compensation limits in the Massachusetts law cause resultant variations in the relative rates of wages payable in different

wage groups, the fact is worth repeating that in similar cases the gross amount of compensation payable in Massachusetts exceeds the amount paid in California up to the point where annual earnings amount to \$1,333.33½.

B. Temporary Total Disability.

Total disabilities of a temporary nature, either in the experience of California or of Massachusetts, probably do not in any case extend over the full period for which compensation payments are provided, and likewise the aggregate amounts of compensation paid do not equal the maximum gross amount limits. Therefore, in comparing the relative benefits for this type of disability under the two laws, the variable factors to be considered are the compensation rates and the weekly compensation limits. For purposes of reasoning, any number of weeks more than 2 and less than 240 may be taken as a common unit to express duration of disability.

A comparison of benefits is best made by reducing the compensation payable in different wage groups to terms of weeks' wages. The results of this comparison for a few cases are shown below.

ANNUAL WAGES.	PER CENT. OF WEEKS' WAGES.		Massachusetts Differences in Per Cents. of Weeks' Wages.
	California.	Massachusetts.	
\$312 00, ¹	69.5	66.6	—2.9
325 25,	66.6	66.6	—
333 33 to \$780 00, ²	65.0	66.6	+1.6
800 00,	65.0	65.0	—
1,040 00,	65.0	50.0	—15.0
1,333 33,	65.0	39.0	—26.0
1,666 66, ³	65.0	31.2	—33.8

¹ Massachusetts lower wage limit.

² \$333.33, California lower wage limit; \$780, Massachusetts upper wage limit.

³ California upper wage limit.

The significance of these figures is brought out more clearly if they are read in connection with the figures which show the distribution of injured by wage groups. This distribution,

given below, is based on the experience in Massachusetts for the second complete year under the act, but is reduced in proportion to the relative number of accidents which exceeded two weeks in duration of disability.

ANNUAL WAGES.	Number of Employees.	Distribution by Per Cents.
\$312 00 and less,	1,130	5.4
312 52- \$780 00,	14,400	68.4
780 52-1,040 00,	3,869	18.4
Over \$1,040 00,	1,658	7.8

A combination of these two tables shows that in 74 per cent. of the cases in Massachusetts compensation may be paid at the rate of $66\frac{2}{3}$ per cent. of weekly wages; in 26 per cent. of the cases there is a decreasing range in the compensation rate from $66\frac{2}{3}$ per cent. to as low as 30 per cent. Approximately 5,500 persons are affected at one point or another by these diminishing weekly rates of compensation for each week of disability. Owing to the wider range of wage limits in California, in this upper group of wage earners there is a corresponding increasing margin, in favor of California, between the relative benefits in the two States.

C. Temporary Partial Disability.

Disabilities which come under this category are, as a rule, not of long duration. At any rate, only in the exceptional case will payments be affected by the limits. Considerable space has been given to analyzing payments under the preceding headings, so only a word is necessary here in comparing California and Massachusetts.

In each State for this type of disability a certain percentage is paid on loss of wages; *i.e.*, on the difference between present and previous annual earnings. In California the rate is 65 per cent. of loss of wages, and in Massachusetts the corresponding rate is $66\frac{2}{3}$ per cent.

D. Permanent Disabilities.

A comparison of the compensation payments in California and Massachusetts for permanent disabilities is much more complex than was the case in the foregoing analysis. First, the two methods of payment are widely divergent; and second, this type of disability places each case on more of an individual basis. Hence, under this section, the simplest and most fruitful method of comparison is one of selected cases from which deductions may be made regarding the relative benefits provided in the two laws. Even this method has shortcomings, as regards the results of actual practice, because of the lack of available experience data under the California law and the consequent necessity for substituting in the place of actual experience approximations based on the surface wording and underlying theory of the law.

Preliminary to making this comparison by concrete cases it is advisable to explain in a general way the basic principles of the provisions under discussion. In California the compensation payments for death amount to three years' wages; that is, 65 per cent. of weekly wages for 240 weeks. This amount has been assumed sufficient to permit a family to become accustomed to its new circumstances. The next step is the development of a ratio between a death benefit and an award for permanent disability.

The unit of measurement for the determination of the degree of disability is estimated percentage loss of earning power. The next assumption is that a worker who has received a severe permanent injury will require 40 per cent. of his former weekly wages for his own support. Therefore, so far as his family is concerned, such a person is the same as dead, and the benefit for a 60 per cent. disability should for this reason equal that paid in the case of death.

This limit of 60 per cent. is the degree of disability up to which it is expected that a person will be able to readapt himself to circumstances. For disabilities of 70 per cent. and over it is assumed that a person is practically incapable of rehabilitation, and therefore at the expiration of 240 weeks such a

person receives for his own maintenance a pension amounting to 1 per cent. of weekly wages for each 1 per cent. of disability in excess of 60 per cent. The margin of disability between 60 and 70 per cent. is provided for by allowing compensation to extend beyond the 240 weeks at the rate of 65 per cent. of wages for four weeks for each additional 1 per cent. of disability. Thus, in the case of a disability of $69\frac{3}{4}$ per cent., compensation would continue for 39 weeks beyond the 240 weeks' period. So much for the method of payments.

Next, the method for determining the degrees of disability should be outlined, as it is different from that used in any of the other States where the percentage loss of earning power is dependent on the physical injury alone, and even then, in most cases, with little real analysis. In California the loss of earning power is measured by a system of co-ordinating weights dependent upon the physical injury, the age, and occupation. In this way power of accommodation and degree of specialization are linked up with physical injury, and in theory a true measure of disability is determined.

In Massachusetts no attempt is made to determine in advance the percentage of disability likely to ensue from a given type of injury. In this way, for the purpose of making awards, each case of this nature is considered according to its individual merits, and largely on an economic basis as the facts are developed. For the purpose, however, of approving lump sum settlements, future loss of wages has to be estimated in accordance with the probable percentage of disability existent in such cases.

In order to compare the benefits in permanent disability cases under the two statutes considered, the examples which follow have been taken from actual Massachusetts experience where the facts are known. These cases have then been treated as if they were subject to the California statute, and the awards have been worked out according to the schedule for permanent disabilities in use in that State. The fact should be stated, in connection with the method of computing benefits under the California law, that any award may be reviewed and revised within a period of 245 weeks from the date of the injury. For

this reason, and also because the number of samples shown is comparatively small, any deductions and conclusions based on the cases which appear below should not be considered as final, but should be considered only as indicative of general tendencies. With these explanations in mind, a fairly reliable idea of the comparative benefits possible in permanent disabilities may be obtained from the following selected cases.

After this preliminary explanation, the next step is to show the relative benefits provided in California and Massachusetts by means of the selected examples given below:—

CASE I.

FACTS.

Nature of injury: loss of sight in both eyes.
Occupation: foreman, gas-producer furnaces.
Age: 47 years.
Wage: \$19.04.

COMPENSATION.

Massachusetts.

66⅔ per cent. of \$19.04 = \$12.65 (maximum = \$10).
\$10 x 100 weeks = \$1,000 (additional).
\$10 x 400 weeks = \$4,000 (loss of wages).
Total, \$5,000.

California.

Disability = 100 per cent. Expectation of life pension = 19.49 years.
65 per cent. of \$19.04 = \$12.38. 40 per cent. of \$19.04 = \$7.62.
\$12.38 x 240 weeks = \$2,971.20 (loss of wages).
\$7.62 x 1,013.48 weeks = \$7,722.71 (pension).
Total, \$10,693.91.

CASE II.

FACTS.

Nature of injury: loss of sight in one eye.
Occupation: operator of automatic screw machine.
Age: 35 years.
Wage: \$15.

COMPENSATION.

Massachusetts.

66⅔ per cent. of \$15 = \$10.
\$10 x 50 weeks = \$500 (additional).
\$10 x 8.7 weeks = \$87 (loss of wages).
Total, \$587.

California.

Disability = $24\frac{1}{4}$ per cent. 65 per cent. of \$15 = \$9.75.

\$9.75 x 97 weeks = \$945.75 (loss of wages).

Total, \$945.75.

CASE III.

FACTS.

Nature of injury: loss of minor arm between shoulder and elbow.

Occupation: fleshing machine operator.

Age: 65 years.

Wage: \$18. Partial, \$12.

COMPENSATION.

Massachusetts.

$66\frac{2}{3}$ per cent. of \$18 = \$12 (maximum = \$10).

$66\frac{2}{3}$ per cent. of (\$18-\$12) = \$4.

\$10 x 50 weeks = \$500 (additional).

\$10 x $6\frac{1}{4}$ weeks = \$65.71 (loss of wages, total).

\$4 x $493\frac{3}{4}$ weeks = \$1,973.71 (loss of wages, partial).

Total, \$2,539.42.

California.

Disability = 66 per cent. 65 per cent. of \$18 = \$11.70.

\$11.70 x 264 weeks = \$3,088.80 (loss of wages).

Total, \$3,088.80.

CASE IV.

FACTS.

Nature of injury: loss at second joints of middle and ring fingers of minor hand.

Occupation: general hand in dyehouse.

Age: 31 years.

Wage: \$9.

COMPENSATION.

Massachusetts.

$66\frac{2}{3}$ per cent. of \$9 = \$6.

\$6 x 25 weeks = \$150 (additional).

\$6 x 6 weeks = \$36 (loss of wages).

Total, \$186.

California.

Disability = $41\frac{1}{2}$ per cent. 65 per cent. of \$9 = \$5.85.

\$5.85 x 18 weeks = \$105.30 (loss of wages).

Total, \$105.30.

CASE V.

FACTS.

Nature of injury: loss at proximal joints of index and middle fingers of major hand.

Occupation: hair picker operator.

Age: 28 years.

Wage: \$9.

COMPENSATION.

Massachusetts.

66⅔ per cent. of \$9 = \$6.

\$6 x 25 weeks = \$150 (additional).

\$6 x 8 weeks = \$48 (loss of wages).

Total, \$198.

California.

Disability = 13 per cent. 65 per cent. of \$9 = \$5.85.

\$5.85 x 52 weeks = \$304.20 (loss of wages).

Total, \$304.20.

CASE VI.

FACTS.

Nature of injury: distal joint of forefinger of major hand.

Occupation: punch press operator.

Age: 26 years.

Wage: \$10.50.

COMPENSATION.

Massachusetts.

66⅔ per cent. of \$10.50 = \$7.

\$7 x 12 weeks = \$84 (additional).

\$7 x 4 weeks = \$28 (loss of wages).

Total, \$112.

California.

Disability = 5¼ per cent. 65 per cent. of \$10.50 = \$6.83.

\$6.83 x 21 weeks = \$143.43 (loss of wages).

Total, \$143.43.

CASE VII.

FACTS.

Nature of injury: loss at distal joint of middle finger of major hand.

Occupation: weaver.

Age: 28 years.

Wage: \$11.68. Partial, \$7.

COMPENSATION.

Massachusetts.

66½ per cent. of \$11.68 = \$7.78. 66½ per cent. of (\$11.68-\$7) = \$3.12.

\$7.78 x 12 weeks = \$93.36 (additional).

\$7.78 x 7 weeks = \$54.46 (loss of wages, total).

\$3.12 x 3 weeks = \$9.36 (loss of wages, partial).

Total, \$157.18.

California.

Combination is not considered a permanent disability.

65 per cent. of \$11.68 = \$7.59. 65 per cent. of (\$11.68-\$7) = \$3.04.

\$7.59 x 7 weeks = \$53.13 (loss of wages, total).

\$3.04 x 3 weeks = \$9.12 (loss of wages, partial).

Total, \$62.25.

The seven cases given above are actual examples taken from the experience of Massachusetts. In applying the California schedule to the facts of these cases the results show the theoretical possibilities under the latter law. A comparative summary of the aggregate payments under the two systems shown above is inserted here to facilitate further comment.

CASE NUMBER.	AGGREGATE PAY- MENTS.		COMPENSATION WEEKS.		
	Massachu- setts.	California.	MASSACHUSETTS.		California by Schedule.
			Additional.	Disability.	
I.,	\$5,000 09	\$10,693 91	100	400.0	1,253
II.,	587 00	945 75	50	8.7	97
III.,	2,539 42	3,088 80	50	500.0	264
IV.,	186 00	105 30	25	6.0	18
V.,	198 00	304 20	25	8.0	52
VI.,	112 00	143 43	12	4.0	21
VII.,	157 18	62 25	12	10.0	10

In five of the seven cases given above, aggregate payments in California exceed those in Massachusetts. Analysis of those cases in which disability had terminated for the time being shows in both States a number of compensation weeks in excess of the period of disability. Up to a certain point such pay-

ments are in accordance with justice, on the ground that a person whose disability is permanent in quality may at any time have to compete in the open labor market along with persons not so handicapped. One of the important problems to be solved in connection with disability benefits has to do with determining the correct weight to be assigned to this factor.

In order to present a still wider range of probabilities from which to illustrate the varying effects of injury, age and occupation, hypothetical cases shown in the accompanying table have been chosen and worked out on the basis of the provisions in the two laws.

In considering these cases, VIII. to XV., inclusive, the fact should be borne in mind that they are merely hypothetical examples to illustrate the manner in which varying degrees of disability are weighted in California. Likewise the figures for Massachusetts merely show that in this State only a very few distinctions are made specifically between different types of disabilities, although in actual practice the widest latitude is possible if each case is followed on its individual development. In this connection the statement should be made that the figures which represent the length of disability in Massachusetts are rough proportions based on the assumption that if 100 additional weeks are allowed for a total disability for which payments may extend for at least 400 weeks, then the duration of a disability for which 50, 25 or 12 weeks' additional compensation is allowed will be in the relation of 400 to 100.

This supposition will not stand the test of practice, and yet, from the point of view of consistency and uniform justice to all, there should be a relationship which would approximate these conditions in actual practice. Except in the serious injury cases the duration of disability periods, and consequently the amounts of compensation, will almost without exception in Massachusetts be less than shown in the tabulation. The California figures are based on the provisions of the schedule for permanent disabilities, and are the results based on an attempt to make systematic the payment of compensation in accordance with the estimated degree of disability. Results from California which will show the number of cases reopened after the

SELECTED SAMPLES OF PERMANENT DISABILITIES.

[In which figures that all occupations and ages are given equal weight in determining percentage of disability.]

CASE NUMBER AND DESCRIPTION	State	Occupation	Age	Disability (Per Cent.)	Wages for Person (Per Cent.)	Weekly Compensation.	Weekly Pension.	Compensation Weeks.	Expected Loss of Life (Per Person Week)	Amount of Compensation.	Amount of Pension.	Total Amount	
CASE VIII.													
Complete loss of sight in both eyes. Wages, \$10.	California.	*	21	100	40	\$4.50	\$1.00	240	1,081.72	\$1,500.00	\$7,320.88	\$8,880.88	
			39	100	40	6.60	4.00	240	1,314.04	1,500.00	5,250.10	6,816.16	
			49	100	40	6.60	4.00	240	910.68	1,500.00	3,702.72	5,322.72	
	Massachusetts.	*	*	-	-	\$6.65	-	500+100	-	\$4,000.00	-	\$1,000.00	
CASE IX.													
Loss of one leg at knee-joint, and major arm between shoulder and elbow. Wages, \$20.	California.	Bookkeeper.	21	74½	14½	\$13.00	\$2.05	240	1,081.72	\$3,120.00	\$5,846.07	\$8,066.07	
			39	78½	16½	13.00	3.75	240	1,314.04	3,120.00	4,927.05	8,017.65	
			49	81½	21½	13.00	4.30	240	940.68	3,120.00	1,044.92	7,104.92	
		Bridge worker.	21	78	18	\$13.00	\$3.00	240	1,081.72	\$3,120.00	\$7,134.10	\$10,254.10	
			39	84½	24½	13.00	5.70	240	1,314.04	3,120.00	7,400.02	10,610.02	
			49	92½	32½	13.00	6.55	240	940.68	3,120.00	6,161.45	8,281.45	
	Massachusetts.	*	*	-	-	\$10.00	-	400+100	-	\$3,000.00	-	\$3,000.00	
CASE X.													
Loss of one leg at knee-joint Wages, \$20.	California.	Bookkeeper.	21	41½	-	\$13.00	-	165	-	\$2,145.00	-	\$2,145.00	
			39	34	-	13.00	-	156	-	1,768.00	-	1,768.00	
			49	30	-	13.00	-	120	-	1,560.00	-	1,560.00	
		Bridge worker.	21	49½	-	\$13.00	-	197	-	\$2,561.00	-	\$2,561.00	
			39	66	-	13.00	-	264	-	3,432.00	-	3,432.00	
			49	75½	15½	13.00	\$3.10	240	940.68	3,120.00	\$2,916.10	6,036.10	
	Massachusetts.	*	*	-	-	\$10.00	-	200+50	-	\$2,500.00	-	\$2,500.00	
CASE XI.													
Loss of major arm between shoulder and elbow. Wages, \$15.	California.	Bookkeeper.	21	67½	-	\$9.75	-	229	-	\$2,232.75	-	\$2,232.75	
			39	68	-	9.75	-	272	-	2,662.00	-	2,662.00	
			49	70½	11½	9.75	\$2.55	210	940.68	2,340.00	\$2,037.60	4,377.60	
		Bridge worker.	21	56½	-	\$9.75	-	227	-	\$2,213.25	-	\$2,213.25	
			39	66	-	9.75	-	264	-	2,574.00	-	2,574.00	
			49	71	11	9.75	\$1.65	240	940.68	2,340.00	\$1,552.12	3,862.12	
	Massachusetts.	*	*	-	-	\$10.00	-	200+50	-	\$2,500.00	-	\$2,500.00	
CASE XII.													
Loss of minor arm between shoulder and elbow. Wages, \$15.	California.	Bridge worker.	21	51½	-	\$9.75	-	207	-	\$2,018.25	-	\$2,018.25	
			39	61	-	9.75	-	244	-	2,379.00	-	2,379.00	
			49	60½	-	9.75	-	265	-	2,583.75	-	2,583.75	
				Massachusetts.	*	*	-	-	\$10.00	-	200+50	-	\$2,500.00
	CASE XIII.												
Loss of thumb and forefinger at proximal joint of major hand. Wages, \$20.	California.	Typesetter.	21	28	-	\$13.00	-	112	-	\$1,456.00	-	\$1,456.00	
			39	38	-	13.00	-	152	-	1,976.00	-	1,976.00	
			49	43½	-	13.00	-	174	-	2,262.00	-	2,262.00	
		Foreman.	21	25	-	\$13.00	-	100	-	\$1,300.00	-	\$1,300.00	
			39	26	-	13.00	-	164	-	1,352.00	-	1,352.00	
			49	26½	-	13.00	-	106	-	1,375.00	-	1,375.00	
	Massachusetts.	*	*	-	-	\$10.00	-	100+25	-	\$1,250.00	-	\$1,250.00	
CASE XIV.													
Loss of index finger at proximal joint of major hand. Wages, \$15.	California.	Stenographer.	21	91	-	\$9.75	-	39	-	\$360.25	-	\$350.25	
			39	20	-	9.75	-	80	-	790.00	-	780.00	
			49	25½	-	9.75	-	103	-	1,004.25	-	1,001.25	
		Punch press operator.	21	71	-	\$9.75	-	29	-	\$282.75	-	\$282.75	
			39	10	-	9.75	-	45	-	399.00	-	390.00	
			49	11½	-	9.75	-	47	-	453.25	-	448.25	
	Massachusetts.	*	*	-	-	\$10.00	-	50+12	-	\$620.00	-	\$620.00	
CASE XV.													
Severe vertigo. Wages, \$18.	California.	Bookkeeper.	21	100	40	\$11.70	\$7.20	240	1,581.72	\$2,808.00	\$11,265.38	\$17,076.38	
			39	100	40	11.70	7.20	240	1,314.04	2,808.00	9,661.08	12,203.08	
			49	100	40	11.70	7.20	240	940.68	2,808.00	6,772.80	9,580.80	
		Bridge worker.	21	100	40	\$11.70	\$7.20	240	1,581.72	\$2,808.00	\$11,265.38	\$17,076.38	
			39	100	40	11.70	7.20	240	1,314.04	2,808.00	9,661.08	12,203.08	
			49	100	40	11.70	7.20	240	940.68	2,808.00	6,772.80	9,580.80	
	Massachusetts.	*	*	-	-	\$10.00	-	405	-	\$4,000.00	-	\$1,000.00	

determination of an award based on the schedule, and also the number of cases which are followed up for the purpose of determining the accuracy of the schedule in practice, would prove highly interesting and valuable. With due allowance for difficulty in arriving at precisely the correct amounts in the hypothetical cases shown in the preceding table, nevertheless for comparative purposes a fairly accurate indication of conditions is possible from a study of this kind. The figures for California show the different weights assigned on account of nature of injury, age and occupation. The figures for Massachusetts show that less distinction is made between different cases in so far as definite statutory provisions are concerned, but these figures do not show the wide range of possibilities in actual practice where the general provisions of the law allow questions of disability to be settled with the development of time and changing conditions. Under a scientific system whereby awards are determined at the outset of disability, if such awards are in the long run accurate the work of administration will be greatly lessened. Unless such accuracy is fairly certain under the Massachusetts method, although the work of administration may be greater, compensation benefits will probably be more in accordance with the merits of the individual case.

COMPARATIVE STUDY OF ACCIDENT STATISTICS IN SELECTED FACTORIES.

INTRODUCTION.

In the months of April, May and June of the year 1914 the Board, through the agency of its inspection department, carried on a campaign of factory inspection for the purpose of studying the causes of accidents for which compensation might be claimed. In this period the statistical studies and ensuing safety inspections covered factories in which the number of employees was over 55,000. Preliminary to making the inspections an analysis of the accidents which had occurred in each factory was made so that the matter of accident prevention might be taken up intelligently with the persons concerned. These studies showed the accident record for each month in the period July 1, 1913, to Dec. 31, 1913. These data were then further classified by causes, total number, disability cases, compensation cases, days lost, compensation days, wage loss and compensation paid. With this history in each case the matter of accident prevention and safety organization was then taken up with some responsible person at the various factories selected for study. Following the discussion of safety work, the inspector then made an inspection of the factory, and on the basis of the conditions noted made a report to the Board embodying recommendations for the elimination of unsafe conditions. Copies of these reports in due course were then sent out to the interested factories for the consideration of the management. Later these factories through a follow-up system were asked to report to the Board the number of recommendations carried out and in process of completion.

The outline given above shows briefly the method by which the Board, through co-operation with employers, started to carry out its duty of investigating the causes of injuries and their elimination. The spirit of co-operation shown the Board by the employers of labor, in general, was extremely gratifying and encouraging.

The work begun in this way at first was applied only to a

selected group of factories, but has been continued since on practically the same basis throughout the Commonwealth.

The facts considered in this chapter deal with the campaign carried on in the months of April, May and June, 1914. The subject is treated on the basis of the statistics compiled from the experience of the selected group of factories. The data shown cover two six-months' periods, — July 1, 1913, to Dec. 31, 1913, and July 1, 1914, to Dec. 31, 1914. The first six-months' period precedes the factory inspection, and the same period a year later shows the accident experience for the same factories.

The table which accompanies this chapter is arranged by concerns, symbolized by numbers, in the order of total reported accident frequency based on the first six months' study. The figures shown are not intended to prove any theory, but are presented for what they may be worth in assisting to develop the problems of accident prevention. In analyzing these figures the fact should be remembered that the data for the second period begin in the month immediately following the last month in which the work of inspection for the group of factories taken as an illustration ended. For this reason in some cases there was really very little time for the results of the safety work to show up in the figures compiled for the period following the inspection. The study, however, is well worth while as an indication of the main tendencies of the problem, and is especially valuable to the Board in continuing its work in the reduction of accidents.

ACCIDENT STUDY AND DEFINITION OF TERMS.

As a preliminary step to considering the figures shown below it is advisable to outline briefly the nature of the study made for the individual concern, and the definition of the units employed. There follows a hypothetical study to illustrate the basis on which a safety inspection is introduced with the management. The study here shown is intended to indicate only the general method employed. In classifying causes the experience of the individual plant is shown in detail. Owing to the fact that these studies have to be made in large numbers, and that the experience is not completed in all cases at the time

the accident reports are analyzed, all items of cost are not included. These studies, therefore, are not considered finished statistical products, but are extremely valuable for disclosing to the Board, and to the interested concerns, briefly, the main tendencies at work in the various plants.

A hypothetical study of this nature is shown below:—

The AAA Company, Boston, Mass. Accident Statistics, July 1, 1913, to Dec. 31, 1913. Massachusetts Industrial Accident Board.

	Number of Accidents.
July,	2
August,	4
September,	1
October,	3
November,	4
December,	7
Total,	21

Special classification for industry:—

Caught by gears,	6
Cleaning machinery in motion,	2
Emery in eye,	1
Caught by belt,	3
Infection from splinter,	1
Fall with ladder,	2
Electric shock,	1
Fall on slippery floor,	2
Strain,	1
Struck by load,	2
Total,	21

Disability cases,	16
Non-disability cases,	5
Compensation cases,	10
Days lost,	405
Compensation days,	230
Wage loss,	\$875
Compensation paid,	\$235

Note.—The costs here stated show only the wage loss and compensation due to lost time for total disability, and do not include the entire money loss due to accidents. In addition, the following costs should figure in the total: medical and hospital expense, additional compensation due to specific injuries, and partial compensation.

All the data included in the study printed above are not used in the tabulation shown later on in the chapter. Likewise the averages which are worked out, and also the number of employees in the various plants, were determined after the inspections were made.

In order to indicate clearly the meaning and significance of the figures shown below it is advisable at this time to define the units employed, and to make an explanation of what is included under these headings.

As previously stated the figures cover the periods July 1, 1913, to Dec. 31, 1913, and July 1, 1914, to Dec. 31, 1914.

Concerns. — The data given at the end of this chapter are arranged by concerns. The names are not made public, but are indicated by symbol numbers, arranged in the order of reported accident frequency for the first period. No special significance, however, is to be attached to this order of arrangement, which is employed merely for the purpose of simplicity. In the studies here printed the basic unit is the concern rather than the individual plant or factory. That is to say, if under one firm or corporate name there should happen to be several separate and distinct plants, for the purposes of this study such plants are combined under one heading. In the actual work of making studies and ensuing inspections the Board works by plant units, but such detail is not necessary in this chapter.

Average Number of Employees. — These figures are derived from reports made by the various concerns to the Board, and represent the average number employed at any one time in the course of a year. No serious attempt has been made to procure the average number of full-time workers in each concern, as experience has shown that only in a few cases is such information available. In view of the fact that data of this detailed nature are not in general to be obtained, it is considered sufficiently accurate to make the number of employees reported to the Board at the time of the inspections serve for the two periods here considered.

Reported Accident. — A reported accident is a notice of injury made to the Board by the employer. All reports so made are here included, whether or not there was any disability or charge on account of medical attention.

Disability Case. — A disability case is one in which there was disability on any day or shift other than the one on which the injury occurred. Under this heading cases where there may have been a few hours' disability on the day on which the injury occurred are not here included.

Compensation Case. — A compensation case is one in which compensation was paid for total disability, when this disability was still existent on or after the fifteenth day following the occurrence of the injury.

Days lost. — A lost day is one on which there was disability on any day other than the one on which the injury occurred.

Compensation Day. — A compensation day is one on which compensation was paid for one day to one person for total disability. The figure under this heading was determined by computing the number of such days per concern from the individual records in each case.

Wage Loss. — The wage loss is an actual figure compiled from the accident report. This is based on the average weekly earnings shown on the various accident reports taken in conjunction with the period of total disability.

Compensation paid. — Information under this heading is derived from the amount of compensation paid in each case on account of total disability.

As explained on the sample accident study, the costs and wage loss stated under the headings given above show only that part which is due to lost time for total disability, and do not include the entire money loss due to accidents. Other real costs not included in this study are those on account of medical and hospital service, additional compensation for specified injuries and compensation for partial disability. Likewise time lost on account of partial disability is not included. These figures, while necessary for computing the cost of insurance, are not essential for the purpose of the study here being made. Obviously, in making up the original studies there is a certain amount of experience not completed at the time this study is needed for the purpose of making the factory inspection. While the cost of medical attention might well be included in these studies, such information was not readily available when the data were compiled.

ANALYSIS OF COMBINED EXPERIENCE FOR GROUP.

Before proceeding to a general analysis of the figures given in the table at the end of the chapter, a brief indication of the results shown by the totals for the combined experience is deemed advisable for the purpose of learning what has been accomplished in the aggregate. These figures and the averages based thereon are of some value as an index with which to compare the experience of the individual concern. The tables given below show the totals for the group:—

Totals and Differences for the Group.

CLASSIFICATION.	July 1, 1913, to Dec. 31, 1913.	July 1, 1914, to Dec. 31, 1914.	Differences.
Reported accidents,	2,403	1,901	—502
Disability cases,	1,138	907	—231
Compensation cases,	422	301	—121
Days lost,	22,548	14,237	—8,311
Compensation days,	11,476	6,401	—5,075
Wage loss,	\$34,667	\$22,195	—\$12,472
Compensation paid,	\$9,035	\$5,329	—\$3,705

Averages for the Group.

CLASSIFICATION.	AVERAGE PER CONCERN.		AVERAGE PER 100 EMPLOYEES.	
	1913.	1914.	1913.	1914.
Reported accidents,	50.06	39.60	4.24	3.35
Disability cases,	23.70	18.89	2.01	1.60
Compensation cases,	8.79	6.27	0.74	0.53
Days lost,	469.75	296.60	39.84	25.15
Compensation days,	239.08	133.35	20.28	11.31
Wage loss,	\$722.22	\$462.39	\$61.26	\$39.22
Compensation paid,	\$188.21	\$111.02	\$15.96	\$9.41

Analysis of this table for the entire group of selected factories shows some highly gratifying results. In all cases for the units as classified there are reductions in frequency and magnitude in the period following the factory inspection, that is, July 1, 1914, to Dec. 31, 1914. The percentage reductions derived from the absolute total figures in the two periods are as follows:—

The number of reported accidents shows a reduction of 21 per cent.

This reduction, although pleasing, does not reflect sufficiently the extent of the results accomplished, owing to the fact that in the second period there would normally be a larger number of cases reported than in the first period. This is so because of a better understanding that all injuries must be reported, even those of a trivial nature. It is conceivable that reported accidents, including minor injuries, would show an increase coexistent with a decrease in the number of cases which cause real disability of varying degrees.

The number of disability cases was reduced 20 per cent. This group likewise includes a good many cases where the disability was short in duration.

The number of compensation cases decreased 29 per cent. for the groups. This figure is more important than those stated just above, owing to the fact that a reduction in the number of cases in which disability extended beyond two weeks from the happening of the injury is a step in the direction of eliminating the more serious types of accidents. This unit, also, is a more valuable figure than the preceding ones, because the factors which cause fluctuation in the returns, independent of accident gravity, are largely eliminated.

If we take each year's combined experience in Massachusetts, since July 1, 1912, as a gauge, it will be found that the total number of cases in which disability extended beyond the period of two weeks shows a tendency to group around a peak of approximately 20,000 cases. The reduction, therefore, of 29 per cent. in compensation cases forms a fairly valuable index as a basis for further operations in the work of making inspections. Obviously, in the limited number of cases here

shown, in which the work of prevention was started, the results indicated are undoubtedly considerably below what will be shown by later studies.

Comparison of the two periods under days lost gives a reduction of 37 per cent. This figure is based on disability cases and the number of days lost in each of these cases. As compared with a reduction of 20.3 per cent. in disability cases according to frequency, the reduction of 37 per cent. in the number of days lost reflects a higher relative reduction in the gravity of these cases. This reduction points out not only a very gratifying saving in the matter of insurance costs, but also means much to employers and employees as an economic saving.

The reduction in the number of compensation days is 44 per cent. This decrease in the gravity of those cases where disability lasted more than two weeks is based on a composite figure which corresponds to the unit for disability days; that is to say, there is a reduction in the number of compensation cases, and also a reduction in the duration of these cases. For this reason the decrease of 44 per cent. here shown means a very material saving which is indicated later in terms of dollars.

In the next units shown — wage loss and compensation paid — the only different factor introduced is the element of money.

The figures under these headings are composed partly of the factors included under days lost and compensation days. These factors, when combined with the frequency distribution by wages and the amount of compensation based on these wages, give results in terms of money. The decrease of 36 per cent. in the wage loss, and of 41 per cent. in compensation paid, have no other significance for the problem of accident prevention than that shown by the reductions in days lost and compensation days, except that the cost of these losses is more plainly indicated. For these two last units the absolute figures representing actual cost reductions are of more importance than the percentage decreases which are reflected under the units of days lost and compensation paid.

In the preceding analysis there are shown reductions in dis-

ability and compensation cases, and in disability and compensation days. To show in another way that the decreases in days lost and in compensation days are not due wholly to a reduction in the number of cases, rather than in part to a reduction in the gravity of each case on the average, the following figures are shown: —

In the first period there were 19 disability days per disability case, against 15 days for the second period. Also, there were 27 compensation days per compensation case in the first period, to be compared with 21 compensation days for the second period.

For the purpose of summarizing the relative reductions indicated above on the basis of the foregoing table, these figures are given below in tabular form: —

*Reductions in Accident Frequency and Gravity by Per Cents.
(First and Second Periods).*

CLASSIFICATION.	Per Cent.	CLASSIFICATION.	Per Cent.
Reported accidents, . . .	20.8	Compensation days, . . .	44.2
Disability cases, . . .	20.3	Wage loss, . . .	36.0
Compensation cases, . . .	28.6	Compensation paid, . . .	41.1
Days lost, . . .	36.8		

At the beginning of this analysis there is shown, along with the table of totals and differences, a table of averages, for the classified units, per concern and per 100 employees. These averages do not need any extended analysis, but are inserted merely to indicate very briefly the possibilities of what can be accomplished by safety inspections once the work is well under way. Since the completion of this first campaign the Board has inspected and made recommendations in practically every insured manufacturing plant in the Commonwealth, with an experience of 20 or more reported accidents per year.

For further details regarding the experience in the individual concerns reference should be made to the table inserted at the end of the chapter. A brief analysis of this table is made below.

SURVEY OF INDIVIDUAL EXPERIENCE.

The analysis made in the preceding section, to show the net results accomplished as a result of the campaign to cover plants employing approximately 55,000 employees, is sufficiently detailed when considering the problem in a large way. For the purpose, however, of understanding the results accomplished in the individual concerns, reference should be made to the table which gives this information. The data there given are valuable as a means of interpreting the totals previously considered, and also to enable the Board to take such action as will tend to reduce accidents still further.

Reference to the detailed table will show that in some cases there are increases rather than decreases. Obviously, these increases operate to lessen the good results obtained in the majority of the concerns. Yet, by and large, even in the cases where there are increases in frequency and gravity, these are comparatively small when contrasted with the reductions made.

Without going into a complete analysis of this table a few comments will assist in visualizing the data there given. For this purpose we may best take two units which express accident gravity, that is, disability days and compensation days.

Under the column of days lost it will be noted that out of the 48 concerns given there were 6 which showed an increase. For these 6 the total increase in days was 602. Against this there is a decrease for the remaining 42 concerns, amounting to 8,913 lost days. Statistically the increase as compared with the decrease is very small. The purpose of the Board, however, is not to rest content until every possible effort is made to prevent and reduce the number of unnecessary accidents.

Under the column of compensation days there are 10 concerns in which there are increases. The total increase in compensation days is 433; the total decrease for the remaining 38 concerns is 5,508 compensation days.

Corresponding to the number of disability days and compensation days are the losses in wages and compensation paid, respectively.

There are 9 concerns which show an increase in wage loss.

This increase is represented by \$1,588; the remaining 39 concerns show a decreased loss of \$14,060.

Under compensation paid there are 11 concerns in which there is an increase, amounting to \$447. In those concerns showing a decrease the amount is \$4,152.

Further analysis of the table is not considered necessary, as any special question may be readily answered by reference to the table printed at the end of the chapter.

CONCLUSION.

This study, showing the results which followed a special campaign of safety inspections in the spring of 1914, has been made for its value in showing the manner in which the Board's work of reducing the number and seriousness of accidents was begun. For the limited number of cases selected originally the results are, on the whole, very encouraging.

Since this initial step the Board's inspectors have covered all the important manufacturing industries of the Commonwealth, along the same general lines as indicated in this chapter. Improvements have been made by the adoption of a standard form used in reporting conditions found and in making recommendations. This report form is not elaborate, but is intended to be readily understood by the persons who have occasion to take action thereon.

At the present time a comparative study of the concerns subsequently inspected is not ready, but the indication is fairly certain that still better results have since been accomplished.

The ultimate aim of the Board is to have inculcated throughout the concerns of the Commonwealth the idea that a real reduction of accidents may be accomplished; first, through the agency of eliminating unsafe conditions, and second, by organizing for safety. Efficient organization in which conditions are kept up to a standard which should be constantly raised is a most vital factor for the reduction of accidents and the enormous economic loss thereby entailed. The Board feels, also, that organization kept at constant pitch is the ultimate solution of reducing the cost of insurance. In the ensuing work of making inspections the Board intends to place increasing

COMPARATIVE ACCIDENT STUDY OF SELECTED CONCERNS IN SAFETY INSPECTION CAMPAIGN TO COVER 50,000 EMPLOYEES. JULY 1, 1913, TO DEC. 31, 1913, AND JULY 1, 1914, TO DEC. 31, 1914.

CONCERN SYMBOL NUMBER.	Number of Employees.	NUMBER OF ACCIDENTS.			DISABILITY CASES.			COMPENSATION CASES.			DAYS LOST.			COMPENSATION PAID.			WAGE LOSS.			COMPENSATION PAID.		
		First Period.	Second Period.	Dif- ference.	First Period.	Second Period.	Dif- ference.	First Period.	Second Period.	Dif- ference.	First Period.	Second Period.	Dif- ference.	First Period.	Second Period.	Dif- ference.	First Period.	Second Period.	Dif- ference.	First Period.	Second Period.	Dif- ference.
1.	3,500	185	161	-24	105	72	-33	38	17	-21	1,563	970	-593	668	342	-326	\$2,045 06	\$1,246 00	-\$799 06	\$473 06	\$247 07	-\$225 99
2.	500	161	115	-46	47	28	-19	8	3	-5	839	221	-618	535	41	-494	1,364 66	405 00	-\$959 66	420 45	35 31	-\$35 14
3.	3,000	154	68	-86	37	52	+15	37	21	-16	1,821	701	-1,120	912	257	-655	4,038 93	1,510 94	-2,527 99	1,048 30	313 54	-\$734 76
4.	2,500	146	224	+78	67	64	-3	20	15	-5	917	791	-126	382	334	-48	1,174 12	1,238 47	+64 35	245 15	318 80	+73 65
5.	5,350	140	147	+7	53	69	+16	20	29	+9	1,157	1,448	+291	688	820	+132	1,173 19	1,994 02	+821 33	529 09	605 66	+76 47
6.	3,400	137	128	-9	97	81	-16	37	35	-2	1,655	1,455	-200	772	656	-116	2,927 53	2,498 86	-428 67	683 52	614 71	-68 81
7.	3,975	124	171	+47	73	88	+15	28	34	+6	2,893	1,600	-1,293	2,173	762	-1,421	3,671 37	1,993 05	-1,678 32	1,396 12	557 81	-\$38 31
8.	125	114	47	-67	44	9	-35	11	2	-9	732	71	-661	408	12	-396	1,398 88	192 28	-1,306 60	402 07	15 14	-\$37 43
9.	3,000	97	12	-85	13	6	-7	5	6	+1	286	168	-118	171	84	-87	569 21	404 56	-164 65	174 56	107 28	-\$67 28
10.	850	89	19	-70	55	16	-39	14	7	-7	558	303	-255	136	117	-19	997 23	441 12	-\$556 11	122 99	96 07	-\$26 92
11.	1,656	75	65	-10	26	31	+5	7	6	-1	313	304	-9	62	88	+26	407 54	370 68	-\$36 86	49 27	62 87	+13 60
12.	3,237	74	73	-1	15	38	+23	15	12	-3	708	694	-14	376	378	+2	896 86	911 57	+14 71	258 33	246 32	-\$12 01
13.	1,500	73	79	+6	10	27	+17	10	8	-2	610	419	-191	109	209	+10	625 54	705 04	+79 50	134 46	183 51	+49 05
14.	4,450	73	17	-56	10	16	+6	1	3	+2	72	123	+51	9	28	+19	110 37	210 65	+100 18	6 94	21 02	+14 98
15.	2,499	62	56	-6	45	32	-13	16	14	-2	679	566	-113	250	263	+13	1,220 51	924 83	-\$296 68	257 76	212 88	-\$44 88
16.	1,500	57	30	-27	62	26	-36	11	9	-2	696	448	-248	273	202	-71	837 01	625 41	-\$211 60	163 23	125 42	-\$37 81
17.	900	51	37	-14	39	24	-15	7	6	-1	515	350	-165	239	172	-67	729 56	571 00	-158 56	160 01	164 66	-\$5 35
18.	700	51	30	-21	29	20	-9	5	6	+1	463	388	-75	264	215	-49	638 67	540 44	-\$98 23	181 81	162 47	-\$19 34
19.	450	47	18	-29	30	11	-19	12	4	-8	509	282	-227	244	181	-63	653 00	324 00	-\$329 00	160 81	110 24	-\$50 57
20.	218	47	28	-19	28	11	-17	9	5	-4	462	200	-262	246	99	-147	717 12	278 86	-\$438 26	191 26	66 41	-\$124 85
21.	450	42	17	-25	33	17	-16	13	10	-3	522	460	-62	233	290	+57	1,461 10	1,283 50	-177 60	278 65	346 96	+68 31
22.	500	37	26	-11	16	14	-2	5	2	-3	216	109	-107	71	19	-62	294 73	163 11	-\$131 62	47 39	17 13	-\$30 26
23.	225	34	33	-1	26	21	-5	6	2	-4	382	204	-178	196	38	-158	661 00	331 00	-\$330 00	164 70	27 35	-\$137 35
24.	185	31	10	-21	22	1	-21	10	1	-9	318	49	-269	133	35	-98	610 76	102 06	-\$508 70	127 03	36 45	-\$90 58
25.	1,170	27	23	-4	21	9	-12	4	1	-3	228	120	-108	60	49	-11	230 39	184 00	-\$46 39	37 84	42 00	+\$4 16
26.	2,200	27	38	+11	16	18	+2	16	7	-9	806	286	-520	615	108	-407	1,295 30	508 01	-\$787 29	375 43	107 00	-\$268 43
27.	1,060	26	36	+10	19	17	-2	9	5	-4	354	191	-163	167	52	-115	379 35	251 62	-\$127 73	97 08	37 88	-\$59 20
28.	354	23	18	-6	3	10	+7	3	4	+1	167	136	-31	19	63	+44	258 05	216 00	-\$42 05	19 83	49 73	+29 90
29.	410	23	33	+10	12	6	-6	6	1	-5	230	63	-177	98	5	-93	395 91	95 78	-\$300 13	96 19	3 75	-\$92 44
30.	450	19	7	-12	3	1	-2	3	-	-3	178	10	-168	29	-	-29	222 28	12 86	-\$209 42	16 27	-	-\$16 27
31.	176	17	19	+2	8	10	+2	2	5	+3	208	184	-24	147	68	-79	287 11	277 41	-\$9 70	100 80	62 80	-\$38 00
32.	40	16	10	-6	6	2	-4	3	-	-3	107	4	-103	35	-	-35	190 12	7 29	-\$182 83	30 42	-	-\$30 42
33.	113	13	4	-9	6	2	-4	2	-	-2	67	6	-61	10	-	-10	58 67	12 57	-\$46 10	5 72	-	-\$5 72
34.	154	12	11	-1	3	7	+4	3	2	-1	175	91	-84	100	53	-47	215 85	106 00	-\$109 85	65 86	40 29	-\$25 57
35.	317	12	6	-6	8	4	-4	5	2	-3	315	90	-225	231	53	-178	449 86	132 93	-\$316 93	169 86	40 07	-\$129 79
36.	225	11	15	+4	9	14	+5	6	5	-1	235	254	+19	138	108	-30	287 07	338 39	+\$51 32	94 37	53 47	-\$40 90
37.	30	10	4	-6	1	1	-	-	-	-	14	5	-9	-	-	-	16 24	6 63	-\$9 61	-	-	-
38.	753	7	8	+1	6	8	+3	-	2	+2	25	97	+72	-	28	+28	38 15	113 00	+\$74 85	-	23 71	+\$23 71
39.	75	7	4	-3	5	-	-6	-	-	-	23	-	-23	-	-	-	18 06	-	-\$18 06	-	-	-
40.	762	7	1	-6	2	1	-1	-	-	-	14	3	-11	-	-	-	17 99	4 29	-\$13 70	-	-	-
41.	300	7	1	-6	7	1	-6	4	1	-3	121	24	-97	26	10	-16	139 81	20 91	-\$118 90	16 38	5 81	-\$10 57
42.	160	6	2	-4	5	1	-4	3	-	-3	129	3	-126	65	-	-65	164 90	2 57	-\$162 33	47 95	-	-\$47 95
43.	55	6	27	+21	3	3	-	1	1	-	75	20	-55	47	2	-45	105 36	45 78	-\$59 58	32 29	3 14	-\$29 15
44.	1,050	6	9	+3	-	4	+4	-	3	+3	-	137	+137	-	91	+01	-	251 07	+251 07	-	85 53	+85 53
45.	475	6	6	-	4	2	-2	2	2	-	73	38	-35	25	10	-15	173 32	72 21	-\$101 11	30 21	13 61	-\$16 60
46.	160	5	3	-2	6	2	-3	2	1	-1	57	44	-13	17	28	+11	51 35	62 14	-\$10 79	12 69	20 00	+7 31
47.	650	4	8	+4	2	7	+5	1	2	+1	77	109	+32	56	41	-15	167 64	298 50	+\$130 86	60 00	54 43	-\$5 57
48.	159	4	7	+3	3	3	-	2	-	-2	84	8	-76	61	-	-61	150 12	8 25	-\$141 87	47 88	-	-\$47 88
Totals.	56,587	2,403	1,901	-502	1,138	907	-231	422	301	-121	22,548	14,237	-8,311	11,476	6,401	-5,075	\$34,666 85	\$22,195 06	-\$12,471 79	\$9,034 53	\$5,320 10	-\$3,705 43

emphasis upon the importance of efficient safety organization. Considerable work already has been done in this field. To accomplish real results, however, every concern of any size should have some type of safety department or organization. The Board trusts that the results shown in this study will indicate what may be accomplished if every employer of labor will co-operate in this very important work.

SETTLEMENTS IN FATAL INJURY CASES BY NON-INSURED EMPLOYERS.

The Board has made a study of the cases of fatally injured employees whose employers were not insured under the Workmen's Compensation Act for the purpose of comparing the settlements made outside of the act with the amount of compensation which would be due in similar cases under the act, and also to ascertain the financial condition of the dependents. Letters were sent to the dependents in all non-insured fatal cases recorded this year, but replies were received from dependents of 75 employees only, many of the letters being returned unclaimed from the former addresses of the employees, due possibly, in some cases, to the change in circumstances of the dependents as a result of the death of the employee. The information gathered as a result of this correspondence is presented in Table XIX.

As shown by a similar investigation last year, the average age of the deceased employees was thirty-eight years; the average weekly wage was \$15. In 10 of the cases there were no dependents; in the remaining cases 39 widows, 83 children and 28 parents, brothers and sisters were dependent upon the deceased employees. The total amount paid in settlements to dependents of all fatally injured employees of non-insured employers was \$35,885, an average of \$478.46 per case. Under the Workmen's Compensation Act the amount due these dependents would be \$122,357.75, an average of \$1,631.43 per case, nearly three and one-half times the amount actually received by the dependents.

Of the 75 cases considered, there were but 31 settlements made. In several other cases there are suits pending or the cases are in the hands of attorneys, but the result is doubtful, and although there may be a reasonable settlement effected eventually, the delay in many cases is the cause of great hardship to the dependents who are left upon the death of the employee without any means of support, and with the additional expense incidental to the sickness and burial, in direct con-

travention to the operation of the Workmen's Compensation Act, which provides for the payment of compensation at the end of the first week after the death of the employee. A number of the cases in which there has been no settlement made nor information received may be attributed to the fact that many of the injured workmen were foreigners whose families were living in Europe, and who, through ignorance of the law or method of procedure in this country, neglected to make any claim. Similar cases under the act are adjusted the same as in cases where dependents live within the State, and compensation is paid as soon as the extent of dependency is ascertained.

The actual settlements made in many cases are in no way proportionate to the wages received and the dependency involved. In 10 cases in which settlements were made in excess of the amount which would be due under the act the total amount paid was about 68 per cent. more than the amount payable under the act, whereas in the remaining cases the settlements made were less than one-third of the amount which these dependents would have received had the employees been insured under the Workmen's Compensation Act. Some large awards have been made in cases where the dependency was comparatively slight, while families totally dependent upon the wages of the employee received a pitiably small amount, if any. Many of the letters on file with the Board will testify to the suffering caused by this system of awards in homes where the breadwinner has been taken away, leaving a widow and small children with absolutely no means of support, or elderly parents too helpless to earn their own living, obliged to depend upon charitable societies or to turn to the city or State for the maintenance of which they have been deprived.

COMPARATIVE COSTS OF COMPENSATION UNDER DIFFERENT SCALES OF BENEFITS.

Computed by the Massachusetts Industrial Accident Board.

In the analysis presented in this discussion the attempt is made to establish a reasonably accurate set of loss cost differentials which will indicate the effect of changes in the law due to legislative enactment. Any increases in cost which may occur in the next few years as the result of causes other than legislative action are not considered in this computation. In other words, the comparative costs under different statutory scales of benefits are all determined as if each set of benefits had been the one in effect in one year taken as a basis.

The Basis Year.

Estimates of cost differences are based on data which show the accident frequency in insured cases under different groups of injury and conditions related thereto for the period July 1, 1913, to June 30, 1914. This is the second year of the act in Massachusetts, and experience thereunder includes a wider range of cases than that for the first year of the act. In this period employees had a better knowledge of the law, and judicial interpretation also tended to make the scope of the law fairly broad. The definition of "personal injury" determined by the Supreme Judicial Court, the inclusion of occupational diseases as injuries under the act, and the precedent established when the court upheld the Industrial Accident Board in its decision that combinations of specific injuries were to be indemnified by taking the sum of the benefits provided as additional compensation for the individual type of injury,—these factors are reflected in the experience here taken as a basis.

Outline of Method and Definition of Terms.

Comparative costs computed on the experience of the basis year show results under three scales of benefits. The provisions which affect cost are briefly indicated as follows:—

Scale I. Benefits in Effect prior to Oct. 1, 1914.

- (1) Two-week waiting period.
- (2) Weekly compensation: 50 per cent. of loss of wages; minimum, \$4; maximum, \$10; no minimum in partial dependency and partial disability.
- (3) Term of payments: —
 - (a) Temporary disabilities for the period.
 - (b) Permanent total disabilities for 500 weeks, but maximum payment \$3,000.
 - (c) Permanent partial disabilities for 300 weeks.
 - (d) Fatal cases with dependency for 300 weeks; with no dependency, last sickness and burial not to exceed \$200.
 - (e) Medical treatment for first two weeks.

Scale II. Benefits in Effect Oct. 1, 1914.

- (1) Two-week waiting period.
- (2) Weekly compensation: 66⅔ per cent. of loss of wages; minimum, \$4; maximum, \$10; no minimum in partial dependency and partial disability.
- (3) Term of payments: the maximum number of weeks is 500 in permanent disability cases, both total and partial, and in fatal cases. Aggregate payments are limited to \$4,000.
- (4) Medical treatment beyond period of two weeks in discretion of the Board.

Scale III. Amendments recommended.

- (1) Ten-day waiting period in cases under 28 days in duration. Payment from date of injury in cases with disability 28 days and over.
- (2) Weekly compensation: 66⅔ per cent. of loss of wages; minimum, \$4; maximum, \$14; no minimum in partial dependency and partial disability.
- (3) Term of payments and total payments remain the same as under Scale II.
- (4) Medical treatment remains the same as under Scale II.
- (5) In cases of minors who receive permanent injuries average wages are conclusively presumed to be \$10 per week.

As stated above, the benefits provided under each scale are applied to the frequency experience derived from the year July

1, 1913, to June 30, 1914. The analysis under each scale is divided into the following groups: —

- A. Temporary total disability.
- B. Specified injuries.
- C. Permanent total disability.
- D. Permanent partial disability.
- E. Fatal cases.
 - 1. Total dependency.
 - 2. Partial dependency.
 - 3. No dependency.
- F. Medical.

Under these headings relative costs are estimated in accordance with the terms of the statute as applied to the frequency of cases in wage groups which would be affected by increases in benefits; and in long-term cases the costs are reduced to terms of the present value of the liability. The rate of discount is $4\frac{1}{2}$ per cent. as used by the Board in determining the amount of a lump sum settlement to be passed upon for approval.

The number of compensation days used in computing the cost of temporary total disability is based on a fairly minute tabulation of duration of total disability. After eliminating disability days due to cases of permanent disability (elsewhere weighted), the figures are in shape to be used in arriving at the number of compensation days under the different scales. Under the 14-day waiting period, compensation days are determined by taking the number of disability days in cases over 2 weeks in duration, and subtracting therefrom 14 days for every compensation case. Under the provision for a reduction of the waiting period, the number of compensation days is determined by adding to the preceding number of compensation days (under the 2-week waiting period) 1 day per case 11 days in duration, 2 days per case 12 days in duration, 3 days per case 13 days in duration, 4 days per case between 14 and 27 days, inclusive, in duration, and 14 days per case in the group 28 to 365 days in duration.

Data on permanent disabilities in the early years of a compensation law are generally acknowledged to be difficult of de-

termination. The test of experience has not been sufficiently long in operation to permit of a precise tabulation of facts, so the application of judgment and a few arbitrary assumptions must be made under this heading. If we take certain types of dismemberments and other injuries which will most probably result in permanent disability, either total or partial, and then arrive at an average percentage loss of earning power, the result should be sufficiently accurate for the purpose of determining the statute differentials.

Medical attention cannot be measured definitely at this time, but knowledge of the manner in which the Board is administering the section which permits additional treatment in unusual cases would tend to show that an estimate of a 10 per cent. increase over the cost under Scale I. would be fairly liberal.

The principal data on which are based the various computations which follow are shown under each group of costs in the tables.

Results.

As shown by the summary of costs in Table IV., if the benefits which went into effect Oct. 1, 1914, had been operative in the period July 1, 1913, to June 30, 1914, the increase in the cost of compensation would have been approximately 40 per cent., and the increase over the cost of the present law due to proposed amendments would have been 12 per cent.

Insurance companies have reported to the Industrial Accident Board figures which show the paid and estimated outstanding losses in compensation claims. If we take their figures for the year July 1, 1913, to June 30, 1914, — \$2,299,521.86, — and increase this amount by 40 per cent., we get \$3,219,330.60, as an estimate of payments which would have been made in this period if the present law had then been in effect. The addition of 12 per cent. to this amount results in the estimated cost under the proposed amendments if effective in this period. Such increase makes the total estimate of cost under the changes considered \$3,605,650.27, or an additional cost of \$386,319.67.

Analysis of the factors which result in the increase of 12 per cent. shows that the total increase would be 3 per cent.

if no change were made in the waiting period. Since 3 per cent. is one-quarter of 12 per cent., and the total increase in dollars is estimated at \$386,319.67, one-quarter of this amount, or \$96,579.91, represents the increased cost due to increasing the maximum weekly compensation to \$14. The balance of \$289,799.76 is the estimated cost due to a reduction in the waiting period.

In conclusion, the statement will bear repeating that all estimates are based on the experience of a particular year, and no allowance has been made for cost factors other than those determined by changes in the statute itself.

TABLE I.—BENEFITS UNDER SCALE I.

A. Temporary Total Disability.

Number of incurred compensation cases,	18,118
Number of compensation days,	603,335
Average number of compensation weeks per case, . .	4.75

WAGE GROUPS.	Number of Cases.	Compensation per Case.	Total Costs, (2) x (3).
(1)	(2)	(3)	(4)
\$6 00 and under,	1,043	\$19 00	\$19,817 00
6 01-\$8 00,	1,763	19 00	33,497 00
8 01-12 00,	6,990	24 94	174,330 60
12 01-15 00,	3,700	33 25	123,025 00
15 01-16 00,	683	38 00	25,954 00
16 01-17 00,	728	40 38	29,396 64
17 01-18 00,	928	42 75	39,672 00
18 01-19 00,	283	45 13	12,771 79
19 01-20 00,	596	47 50	28,310 00
21 00 and over,	1,404	47 50	66,690 00
Totals,	18,118	—	\$553,464 03

*B. Specified Injuries.**Distribution by Wage Groups and Weeks' Compensation.*

WAGE GROUPS.	150 Weeks.	100 Weeks.	75 Weeks.	50 Weeks.	37 Weeks.	25 Weeks.	12 Weeks.
\$6 00 and under, . . .	—	—	—	4	—	2	61
6 01—\$8 00, . . .	—	—	—	14	—	10	96
8 01—12 00, . . .	—	1	—	51	—	52	309
12 01—15 00, . . .	—	—	1	24	1	17	152
15 01—16 00, . . .	—	—	—	4	—	4	20
16 01—17 00, . . .	—	—	—	3	—	5	33
17 01—18 00, . . .	—	—	—	7	—	3	42
18 01—19 00, . . .	—	—	—	2	—	1	12
19 01—20 00, . . .	—	—	—	2	—	5	22
21 00 and over, . . .	1	2	—	7	—	10	60
Totals, . . .	1	3	1	118	1	109	807

Summary.

WAGE GROUPS.	Weekly Com- pensation.	Number of Com- pensation Weeks.	Total Costs, (2) x (3).
(1)	(2)	(3)	(4)
\$6 00 and under,	\$4 00	982	\$3,928 00
6 01—\$8 00,	4 00	2,102	8,408 00
8 01—12 00,	5 25	7,658	40,204 50
12 01—15 00,	7 00	3,561	24,927 00
15 01—16 00,	8 00	540	4,320 00
16 01—17 00,	8 50	671	5,703 50
17 01—18 00,	9 00	929	8,361 00
18 01—19 00,	9 50	269	2,555 50
19 01—20 00,	10 00	489	4,890 00
21 00 and over,	10 00	1,670	16,700 00
Totals,	—	18,871	\$119,997 50

C. Permanent Total Disability.

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Present Value of \$1 per Week for Term.	Total Costs, (2) x (3) x (4).
(1)	(2)	(3)	(4)	(5)
\$8 01-\$12 00, . .	2	\$5 25	\$407 507	\$4,278 82
12 01- 15 00, . .	5	7 00	359 254	12,573 89
21 00 and over, . .	6	10 00	264 834	15,890 04
Totals, . .	13	—	—	\$32,742 75

*D. Permanent Partial Disability.**Extent of Impairment estimated at 20 Per Cent.*

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Present Value for 300 Weeks.	Total Costs, (2) x (4).
(1)	(2)	(3)	(4)	(5)
\$6 00 and under, .	34	\$0 60	\$158 90	\$5,402 60
6 01-\$8 00, . .	67	70	185 38	12,420 46
8 01-12 00, . .	241	1 05	278 08	67,017 28
12 01-15 00, . .	111	1 40	370 76	41,154 36
15 01-16 00, . .	19	1 60	423 73	8,050 87
16 01-17 00, . .	23	1 70	450 22	10,355 06
17 01-18 00, . .	29	1 80	476 70	13,824 30
18 01-19 00, . .	9	1 90	503 18	4,528 62
19 01-20 00, . .	18	2 00	529 67	9,534 06
21 00 and over, . .	44	2 10	556 15	24,470 60
Totals, . .	595	—	—	\$196,758 21

*E. Fatal Cases.**1. Total Dependency.*

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Present Value for 300 Weeks.	Total Costs, (2) x (4).
(1)	(2)	(3)	(4)	(5)
\$6 00 and under, .	5	\$4 00	\$1,059 34	\$5,296 70
6 01-\$8 00, . .	8	4 00	1,059 34	8,474 72
8 01-12 00, . .	62	5 25	1,390 38	86,203 56
12 01-15 00, . .	62	7 00	1,853 84	114,938 08
15 01-16 00, . .	17	8 00	2,118 67	36,017 39
16 01-17 00, . .	12	8 50	2,251 09	27,013 08
17 01-18 00, . .	24	9 00	2,383 51	57,204 24
18 01-19 00, . .	8	9 50	2,515 92	20,127 36
19 01-20 00, . .	7	10 00	2,648 34	18,538 38
21 00 and over, . .	41	10 00	2,648 34	108,581 94
Totals, . . .	246	—	—	\$482,395 45

2. Partial Dependency.

WAGE CONTRIBUTION.	Number of Cases.	Weekly Compensation.	Present Value for 300 Weeks.	Total Costs, (2) x (4).
(1)	(2)	(3)	(4)	(5)
\$0 00-\$2 00, . .	4	\$1 00	\$264 834	\$1,059 34
2 01- 3 00, . .	8	1 25	331 043	2,648 34
3 01- 4 00, . .	6	1 75	463 460	2,780 76
4 01- 5 00, . .	12	2 25	595 877	7,150 52
5 01- 6 00, . .	13	2 75	728 294	9,467 82
6 01- 7 00, . .	3	3 25	860 711	2,582 13
7 01- 8 00, . .	7	3 75	993 128	6,951 90
8 01- 9 00, . .	3	4 25	1,125 545	3,376 62
9 01-10 00, . .	4	4 75	1,257 962	5,031 85
10 01-11 00, . .	1	5 25	1,390 379	1,390 38
12 01-13 00, . .	1	6 25	1,655 213	1,655 21
13 01-14 00, . .	1	6 75	1,787 630	1,787 63
14 01-15 00, . .	1	7 25	1,920 047	1,920 05
Totals, . . .	64	—	—	\$47,802 55

3. *No Dependency.*

Number of cases,	56
Estimated cost per case,	\$150 00
Total cost,	\$8,400 00

F. Medical.

Cost is 22.4 per cent. of the total cost under this Scale I.

TABLE II.—BENEFITS UNDER SCALE II.

A. Temporary Total Disability.

Number of insured compensation cases,	18,118
Number of compensation days,	603,335
Average number of compensation weeks per case,	4.75

WAGE GROUPS.	Number of Cases.	Compensation per Case.	Total Costs, (2) x (3).
(1)	(2)	(3)	(4)
\$6 00 and under,	1,043	\$19 00	\$19,817 00
6 01—\$8 00,	1,763	22 17	39,085 71
8 01—12 00,	6,990	33 25	232,417 50
12 01—15 00,	3,700	44 33	164,021 00
15 01 and over,	4,622	47 50	219,545 00
Totals,	18,118	—	\$674,886 21

B. Specified Injuries.

WAGE GROUPS.	Weekly Compensation.	Number of Compensation Weeks.	Total Costs, (2) x (3).
(1)	(2)	(3)	(4)
\$6 00 and under,	\$4 00	982	\$3,928 00
6 01—\$8 00,	4 66 $\frac{2}{3}$	2,102	9,809 33
8 01—12 00,	7 00	7,658	53,606 00
12 01—15 00,	9 33 $\frac{1}{3}$	3,561	33,236 00
15 01 and over,	10 00	4,568	45,680 00
Totals,	—	18,871	\$146,259 33

C. Permanent Total Disability.

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Present Value of \$1 per Week for Term.	Total Costs, (2) x (3) x (4).
(1)	(2)	(3)	(4)	(5)
\$8 01-\$12 00, . .	2	\$7 00	\$407 507	\$5,705 10
12 01-- 15 00, . .	5	9 33 $\frac{1}{3}$	359 254	16,765 19
21 00 and over, . .	6	10 00	339 191	20,351 46
Totals,	13	—	—	\$42,821 75

*D. Permanent Partial Disability.**Impairment estimated at 20 Per Cent.*

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Present Value for 500 Weeks.	Total Costs, (2) x (4).
(1)	(2)	(3)	(4)	(5)
\$6 00 and under, . .	34	\$0 80	\$326 005	\$11,084 17
6 01-\$8 00, . . .	67	93	378 981	25,391 73
8 01-12 00, . . .	241	1 40	570 509	137,492 67
12 01-15 00, . . .	111	1 87	762 038	84,586 22
15 01-16 00, . . .	19	2 13	867 989	16,491 79
16 01-17 00, . . .	23	2 27	925 040	21,275 92
17 01-18 00, . . .	29	2 40	978 016	28,362 46
18 01-19 00, . . .	9	2 53	1,030 992	9,278 93
19 01-20 00, . . .	18	2 67	1,088 043	19,584 77
21 00 and over, . .	44	2 80	1,141 019	50,204 84
Totals,	595	—	—	\$403,753 50

*E. Fatal Cases.**1. Total Dependency.*

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Present Value for Term.	Total Costs, (2) x (4).
(1)	(2)	(3)	(4)	(5)
\$6 00 and under, . . .	5	\$4 00	\$1,630 03	\$8,150 14
6 01-\$8 00, . . .	8	4 66 $\frac{2}{3}$	1,901 70	15,213 60
8 01-12 00, . . .	62	7 00	2,852 55	176,858 10
12 01-15 00, . . .	62	9 33 $\frac{1}{3}$	3,353 04	207,888 48
15 01 and over, . . .	109	10 00	3,391 91	369,718 19
Totals, . . .	246	—	—	\$777,828 51

2. Partial Dependency.

WAGE CONTRIBUTION.	Number of Cases.	Weekly Compensation.	Present Value for Term.	Total Costs, (2) x (4).
(1)	(2)	(3)	(4)	(5)
\$0 00-\$2 00, . . .	4	\$1 33 $\frac{1}{3}$	\$543 343	\$2,173 37
2 01- 3 00, . . .	8	1 66 $\frac{2}{3}$	679 178	5,433 42
3 01- 4 00, . . .	6	2 33 $\frac{1}{3}$	950 850	5,705 10
4 01- 5 00, . . .	12	3 00	1,222 521	14,670 25
5 01- 6 00, . . .	13	3 66 $\frac{2}{3}$	1,494 192	19,424 50
6 01- 7 00, . . .	3	4 33 $\frac{1}{3}$	1,765 864	5,297 59
7 01- 8 00, . . .	7	5 00	2,037 535	14,262 75
8 01- 9 00, . . .	3	5 66 $\frac{2}{3}$	2,309 206	6,927 62
9 01-10 00, . . .	4	6 33 $\frac{1}{3}$	2,580 878	10,323 51
10 01-11 00, . . .	1	7 00	2,852 549	2,852 55
12 01-13 00, . . .	1	8 33 $\frac{1}{3}$	3,285 850	3,285 85
13 01-14 00, . . .	1	9 00	3,332 142	3,332 14
14 01-15 00, . . .	1	9 66 $\frac{2}{3}$	3,373 241	3,373 24
Totals, . . .	64	—	—	\$97,061 89

3. No Dependency.

The cost is the same as under Scale I.

F. Medical.

Increase is estimated as 10 per cent. over the cost under Scale I.

TABLE III.—BENEFITS UNDER SCALE III.

A. Temporary Total Disability.

Number of insured compensation cases, . . . 22,638
 Number of compensation days, . . . 796,913
 Average number of compensation weeks per case, . 5.02

WAGE GROUPS.	Number of Cases.	Compensation per Case.	Total Costs, (2) x (3).
(1)	(2)	(3)	(4)
\$6 00 and under, . . .	1,304	\$20 08	\$26,184 32
6 01-\$8 00, . . .	2,203	23 42	51,594 26
8 01-12 00, . . .	8,734	35 14	306,912 76
12 01-15 00, . . .	4,623	46 85	216,587 55
15 01-16 00, . . .	853	53 54	45,669 62
16 01-17 00, . . .	910	56 89	51,769 90
17 01-18 00, . . .	1,159	60 24	69,818 16
18 01-19 00, . . .	353	63 58	22,443 74
19 01-20 00, . . .	745	66 93	49,862 85
21 00 and over, . . .	1,754	70 28	123,271 12
Totals, . . .	22,638	—	\$964,114 28

B. Specified Injuries.

WAGE GROUPS.	Weekly Compensation.	Number of Compensation Weeks.	Total Costs, (2) x (3).
(1)	(2)	(3)	(4)
\$6 00 and under, . . .	\$4 00	982	\$3,928 00
6 01-\$8 00, . . .	4 66 $\frac{2}{3}$	2,102	9,809 33
8 01-12 00, . . .	7 00	7,658	53,606 00
12 01-15 00, . . .	9 33 $\frac{1}{3}$	3,561	33,236 00
15 01-16 00, . . .	10 66 $\frac{2}{3}$	540	5,760 00
16 01-17 00, . . .	11 33 $\frac{1}{3}$	671	7,604 67
17 01-18 00, . . .	12 00	929	11,148 00
18 01-19 00, . . .	12 66 $\frac{2}{3}$	269	3,407 33
19 01-20 00, . . .	13 33 $\frac{1}{3}$	489	6,520 00
21 00 and over, . . .	14 00	1,670	23,380 00
Totals, . . .	—	18,871	\$158,399 33

C. Permanent Total Disability.

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Present Value of \$1 per Week for Term.	Total Costs, (2) x (3) x (4).
(1)	(2)	(3)	(4)	(5)
\$8 01-\$12 00, . .	2	\$7 00	\$407 507	\$5,705 10
12 01- 15 00, . .	5	9 33 $\frac{1}{3}$	359 254	16,765 19
21 00 and over, . .	6	14 00	253 679	21,309 04
Totals,	13	—	—	\$43,779 33

D. Permanent Partial Disability.

Costs under this group would remain the same as under Scale II., since there are no compensation cases in excess of \$10 per week.

*E. Fatal Cases.**1. Total Dependency.*

Although there is no increase in the nominal cost of compensation, since the maximum of \$4,000 remains the same, the shorter term of payments in cases over \$10 per week results in a lower deduction for discount than under Scale II.

WAGE GROUPS.	Number of Cases.	Weekly Compensation.	Length of Term (Weeks).	Present Value for Term.	Total Costs (2) x (5).
(1)	(2)	(3)	(4)	(5)	(6)
\$6 00 and under, .	5	\$4 00	500.00	\$1,630 03	\$8,150 15
6 01-\$8 00, . .	8	4 66 $\frac{2}{3}$	500.00	1,901 70	15,213 60
8 01-12 00, . .	62	7 00	500.00	2,852 55	176,858 10
12 01-15 00, . .	62	9 33 $\frac{1}{3}$	428.50	3,353 04	207,888 48
15 01-16 00, . .	17	10 66 $\frac{2}{3}$	375.00	3,426 00	58,242 00
16 01-17 00, . .	12	11 33 $\frac{1}{3}$	352.90	3,456 12	41,473 44
17 01-18 00, . .	24	12 00	333.30	3,483 58	83,605 92
18 01-19 00, . .	8	12 66 $\frac{2}{3}$	315.78	3,507 78	28,062 24
19 01-20 00, . .	7	13 33 $\frac{1}{3}$	300.00	3,531 12	24,717 84
21 00 and over, . .	41	14 00	285.70	3,551 50	145,611 50
Totals,	246	—	—	—	\$789,823 27

2. Partial Dependency.

There is no increase over Scale II.

3. No Dependency.

Cost is same as under Scale I. and Scale II.

F. Medical.

No increase is computed over Scale II.

TABLE IV. — COMPARISON OF BENEFITS UNDER THREE SCALES.

Summary of Costs.

	Scale I.	Scale II.	Scale III.
Temporary total, . . .	\$553,464 03	\$674,886 21	\$964,114 28
Specified,	119,997 50	146,259 33	158,399 33
Permanent total, . . .	32,742 75	42,821 75	43,779 33
Permanent partial, . .	196,758 21	403,753 50	403,753 50
Fatal,	538,598 00	883,290 40	895,284 19
Medical,	416,040 88	457,644 97	457,644 97
Totals,	\$1,857,601 37	\$2,608,656 16	\$2,922,975 60

Differentials.

$$\frac{\text{Scale II.}}{\text{Scale I.}} = 1.404$$

$$\frac{\text{Scale III.}}{\text{Scale I.}} = 1.573$$

$$\frac{\text{Scale III.}}{\text{Scale II.}} = 1.120$$

TABLE V. — ANALYSIS OF 12 PER CENT. INCREASE, SCALE III. OVER SCALE II.

1. Cost of increasing the Maximum.

[Temporary total disability under Scale III. on basis of 14-day waiting period.]

Number of Cases.	Com- pensation per Case.	Total Costs, (1) x (2).	Number of Cases.	Com- pensation per Case.	Total Costs, (1) x (2).
(1)	(2)	(3)	(1)	(2)	(3)
1,043	\$19 00	\$19,875 00	928	\$57 00	\$52,896 00
1,763	22 17	39,085 71	283	60 16	17,025 28
6,990	33 25	232,417 50	596	63 33	37,744 68
3,700	44 33	164,021 00	1,404	66 50	93,366 00
683	50 66	34,600 78	18,118	—	\$730,220 19
728	53 83	39,188 24			

Adjustment.

Other groups of cost under Scale III. are not affected by reduction of waiting period.

Temporary disability under Scale III., with —		
Reduced waiting period and \$14 maximum is		\$964,114 28
14-day waiting period and \$14 maximum is		730,220 19
Original total of Scale III. is reduced by		\$233,894 09
Therefore, said total		\$2,922,975 60
Less		233,894 09
Gives changed basis total		\$2,689,081 51
This amount, divided by the total of Scale II.,		\$2,608,656 16
Gives the total average differential		1.03

2. Cost of Reduced Waiting Period.

[Temporary total disability under Scale II. on basis of 10-day waiting period.]

Number of Cases.	Com-pensation per Case.	Total Costs, (1) x (2).	Number of Cases.	Com-pensation per Case.	Total Costs, (1) x (2).
(1)	(2)	(3)	(1)	(2)	(3)
1,304	\$20 08	\$26,184 32	4,623	\$46 85	\$216,587 55
2,203	23 42	51,594 26	5,774	50 20	289,854 80
8,734	35 14	306,912 76	22,638	—	\$891,133 69

Adjustment.

Temporary total disability under Scale II., with —		
\$10 maximum and reduced waiting period is		\$891,133 69
\$10 maximum and 14-day waiting period is		674,886 21
Original total of Scale II. is increased by		\$216,247 48
Said total here added		2,608,656 16
Gives changed basis total		\$2,824,903 64
This amount, divided by the total of Scale II.,		\$2,608,656 16
Gives the total average differential		1.083

A GENERAL OR COMPULSORY ACT.

The idea upon which the modern law of workmen's compensation for injuries received in the course of their work rests is that it is just and reasonable that employees, or their dependents, should be paid compensation for such injuries from the business in which they are received, and that it is not just, or a wise social policy, to leave employees who are thus injured, or their helpless families, to destitution, or the inadequate aid and stigma of charity.

The law of Massachusetts requires that a report of every occupational injury to an employee in the State be made by the employer to the Industrial Accident Board. This, and other provisions of the act, declare the Commonwealth's concern with all such injuries, their cause and results. It is a shock to the sense of justice that when many injuries thus reported are investigated, it is found that no compensation can be obtained by the injured for their incapacities, or by their dependent families, in case of death, — whereas in other cases, under like circumstances and conditions, compensation is provided. This is due to the fact that our compensation law is an elective act, so called, and not a general law, uniform in its application.

The evil effect of this system of discrimination is not only disastrous and unjust to the injured persons and their families, but to society in general. The instances of this injustice and inequality are many. They appear through children in the schools, in the work of charities, and in cases before the Industrial Accident Board, when it is learned that employers have not accepted the act.

The first essential of any law is that it should apply equally to all. Legislation should be enacted to make the Workmen's Compensation Act a general law, applying to all employers and employees and their dependents, within the classes mentioned in our present elective act, and to such others, and on such conditions, as may be included. If a constitutional amendment is necessary to permit the enactment of such a general law, proper proceedings for such an amendment should be taken.

In order to avoid misunderstanding in the consideration of this important matter, it should be remembered that the words "compulsory" and "elective," which are used in the discussion of compensation acts, are used only in a very technical constitutional sense. A general law, applying as here recommended, to those affected by occupational injuries, would be in its essential nature no more compulsory than other equal and general laws. Such a law has been approved by the conference of commissioners on uniform State laws, and recommended by them for adoption in all the States.

SIMPLE PROCEDURE UNDER THE LAW.

The Board has endeavored to make its methods of procedure as simple and free from technicalities and unnecessary rules as possible, believing that unnecessary rules and technicalities are an obstruction to the truth, justice, and efficient administration. The Board believes that this simplicity of procedure has proven so satisfactory and essential, that it recommends that language be placed in the act to make it certain such practice may be followed, not restricted by the ordinary common law or statutory rules of procedure or evidence.

The following amendment is suggested:—

Strike out in Part III., section three, the sentence "Process and procedure under this act shall be as summary as reasonably may be", and insert in place thereof the following:—The board, or its members, or committees of arbitration (in making an investigation or inquiry or conducting a hearing) shall not be bound by common law or statutory rules of evidence, or by technical or formal rules of procedure, except as provided by said chapter,—so that said section as amended will read:—*Section 3.* The board may make rules not inconsistent with the act for carrying out the provisions of the act. The board or its members, or committees of arbitration (in making an investigation or inquiry or conducting a hearing) shall not be bound by common law or statutory rules of evidence, or by technical or formal rules of procedure, except as provided by said chapter. The board or any member thereof shall have the power to subpoena witnesses, administer oaths, and to examine such parts of the books and records of the parties to a proceeding as relate to questions in dispute. The fees for attending as a witness before the industrial accident board shall be one dollar and fifty cents a day; in both cases five cents a mile for travel out and home. The superior court shall have power to enforce by proper proceedings the provisions of this section relating to the attendance and testimony of witnesses and the examination of books and records.

CURTAILING THE WAITING PERIOD.

A curtailment of the period of waiting, during which medical attendance is furnished but no compensation paid, should be taken up by the Legislature, in the opinion of the Board. There is urgent necessity for a shortening of the waiting period, in all cases, to ten days, and the removal of the waiting period in such cases as incapacitate the employee for work for a period of more than twenty-eight days. The important reason for a waiting period is the discouraging of malingering, and as it is a fact that such cases are practically unknown in this Commonwealth, under the watchful care of the administering body, the importance of a long waiting period is diminished. We therefore recommend that the law be changed so as to provide for a waiting period of ten days in all cases in which the incapacity does not exceed twenty-eight days, and in all other cases where the period of incapacity exceeds such period of twenty-eight days from the date of injury compensation should date back to the day of injury. The passage of such an amendment will result in greater satisfaction with the law and give injured workmen the compensation to which they are entitled and which they require by reason of the exigencies of the situation arising as a result of their inability to earn wages.

The following amendment will make this recommendation effective:—

Part II., Section 4.—No compensation shall be paid under this act for any injury which does not incapacitate the employee for a period of at least ten days from earning wages, but if incapacity extends beyond the period of ten days, compensation shall begin on the eleventh day after the injury; *provided, however,* that if the employee is incapacitated for a period of twenty-eight days from earning full wages, compensation shall begin on the day of the injury.

THE “WAITING PERIOD” IN FOREIGN COUNTRIES.

In connection with the plan to reduce the “waiting period” from fourteen to ten days, a study of the length of such period in foreign countries is of interest.

The "waiting period" is that portion of time during which the employee who receives a personal injury arising out of and in the course of his employment is not entitled to any compensation. It is customary, usually, to furnish medical and hospital services and medicines during this period.

The period of waiting in England is two weeks, and this also is the rule in the colonies of Great Britain. In Belgium the waiting period is one week; in Finland, six days; in France, four days; in Austria Hungary and Russia, three days; in the Netherlands, two days; and in Spain and Italy there is no period of waiting.

The problem of caring for employees who are incapacitated for a short period of time is met in a very effective manner in Germany, Austria Hungary and Russia, where a system of compulsory sickness insurance supplements the compensation system. In these countries only fatal accidents, all cases of permanent disability and certain types of cases causing temporary disability ranging from four weeks in Austria to ten in Hungary, and increasing to thirteen in Germany, are covered by workmen's compensation insurance.

The "waiting period" problem is nearly wholly provided for in Great Britain by reason of the fact that about all workmen are members of the well-known "friendly societies," which give ample care and protection to the injured employees during the time in which no compensation is paid.

THE "WAITING PERIOD" IN THE UNITED STATES.

The "waiting period," or the time during which the employee is furnished medical and hospital attention, varies from no waiting period in several of the States to two weeks, the latter being the usual time of waiting in the majority of the Commonwealths of the country.

In Oregon the employee is paid from the date of the injury; in Washington compensation dates also from the day of the injury, provided the employee sustains at least a 5 per cent. loss of earning power. In Illinois the waiting period in cases of permanent incapacity for work is one day, in all other cases six days; in Ohio, Texas and West Virginia the period of wait-

ing is one week. In California, Connecticut, Iowa, Kansas, Louisiana, Massachusetts, Minnesota, New Jersey, New York and Rhode Island the employee is obliged, under present laws, to wait two weeks before any compensation is due.

In several of the other States variations from the above program prevail. In Arizona, for example, the period of waiting is two weeks, but if the employee is incapacitated for a longer time compensation dates back to the day of the injury. Maryland has a provision of waiting for two weeks in all cases, except those in which the employee is permanently totally disabled, when the period is cut down to one week. Michigan, Nebraska and Nevada have provisions requiring a waiting period of two weeks, except when the employee is incapacitated for a period of eight weeks, when compensation is dated back to the day of injury.

The tendency has been towards a shortening of the waiting period from two weeks to a lesser period, and many of the States recognize that compensation should date from the day of the injury in cases in which the incapacity is of long duration.

AN INCREASE IN THE MAXIMUM PAYMENT.

The Board recommends that the maximum weekly amount payable in all cases under the statute be changed from \$10 to \$14, the minimum payment to remain as it now is, at \$4 weekly. The General Court of 1914 amended the statute in certain particulars, the most important of which was the provision increasing the rate of compensation from 50 to $66\frac{2}{3}$ per cent. of the average weekly wages of the injured employees and their dependents. No change, however, was made in the minimum and maximum weekly payments of \$4 and \$10, respectively. The maximum weekly payment should be increased to \$14, so that the skilled employee will receive at least a share of the benefits provided by the increase in the rate of compensation from one-half to two-thirds.

To make this recommendation effective, the Board suggests the following amendment: —

Part II., Section 6. — If death results from the injury, the association shall pay the dependents of the employee, wholly dependent upon his earnings for support at the time of the injury, a weekly payment equal to two thirds of his average weekly wages, but not more than fourteen dollars nor less than four dollars a week for a period of five hundred weeks from the date of the injury; but in no case shall the amount be more than four thousand dollars. If the employee leaves dependents only partially dependent upon his earnings for support at the time of his injury, the association shall pay such dependents a weekly compensation equal to the same proportion of the weekly payments for the benefit of persons wholly dependent as the amount contributed by the employee to such partial dependents bears to the annual earnings of the deceased at the time of his injury. When weekly payments have been made to an injured employee before his death, the compensation to dependents shall begin from the date of the last of such payments, but shall not continue more than five hundred weeks from the date of the injury.

Part II., Section 9. — While the incapacity for work resulting from the injury is total, the association shall pay the injured employee a weekly compensation equal to sixty-six and two thirds per cent of his average weekly wages, but not more than fourteen dollars nor less than four dollars a week, and in no case shall the period covered by

such compensation be greater than five hundred weeks, nor the amount more than four thousand dollars.

Part II., Section 10.—While the incapacity for work resulting from the injury is partial, the association shall pay the injured employee a weekly compensation equal to sixty-six and two thirds per cent of the difference between his average weekly wages before the injury and the average weekly wages which he is able to earn thereafter, but not more than fourteen dollars a week; and in no case shall the period covered by such compensation be greater than five hundred weeks from the date of the injury, nor the amount more than four thousand dollars.

Part II., Section 11.—In case of the following specified injuries the amounts hereinafter named shall be paid in addition to all other compensation:—

(a) For the loss by severance of both hands at or above the wrist, or both feet at or above the ankle, or the loss of one hand and one foot, or the reduction to one tenth of normal vision in both eyes with glasses, sixty-six and two thirds per cent of the average weekly wages of the injured person, but not more than fourteen dollars nor less than four dollars a week, for a period of one hundred weeks.

(b) For the loss by severance of either hand, at or above the wrist, of either foot at or above the ankle, or the reduction to one tenth of normal vision in either eye with glasses, sixty-six and two thirds per cent of the average weekly wages of the injured person, for each hand or foot so severed, but not more than fourteen dollars nor less than four dollars a week for a period of fifty weeks.

(c) For the loss by severance at or above the second joint of two or more fingers, including thumbs, of the same hand, or of two or more toes of the same foot, sixty-six and two thirds per cent of the average weekly wages of the injured person, but not more than fourteen dollars nor less than four dollars a week, for a period of twenty-five weeks for each hand or foot so injured.

(d) For the loss by severance of at least one phalange of a finger, thumb, or toe, sixty-six and two thirds per cent of the average weekly wages of the injured person, but not more than fourteen dollars nor less than four dollars a week, for a period of twelve weeks for each hand or foot so injured.

(e) The additional amounts provided for in this section in case of the loss of a hand, foot, thumb, finger, toe or phalange, shall also be paid for the number of weeks above specified, in case the injury is such that the hand, foot, thumb, finger, toe or phalange is not lost, but so injured as to be permanently incapable of use.

THE PROBLEM OF THE MINOR.

The problem of the minor who receives a serious and permanently disabling injury has been solved partially through the willingness of certain insurers to aid the Board and give the minor an opportunity, through the continuance of the weekly payments provided by the statute, to obtain special training along technical or commercial lines and thereby become fitted for remunerative wage-earning work in the future.

A one-armed boy of sixteen, who earns \$4 or \$5 a week at the time of his injury, can be provided with a situation paying him the same rate of wages that he was earning when the injury occurred. Usually such situations offer the minor no prospect of an improvement in his earning capacity, and full justice is not done him under the statute.

Several cases in which insurers have waived their right to insist upon the minor returning to work at a low rate of wages are on the records of the Board. In one of these cases an uneducated French-Canadian lad, whose right hand was severed by reason of the injury, is receiving a commercial education at the expense of the insurer. He has been taught to write with the left hand and by dint of constant practice has become a good penman. At the end of his course it is expected that he will be placed in a position in his home city where his knowledge of the English and French languages, together with his commercial education, will assure him of a position in which he can attain a satisfactory rate of wages commensurate with his needs. Another boy, with mangled fingers, is attending an industrial school, and has taken up the practical work of a skilled mechanic. A third boy, who was the support of an invalid mother, has been sent back to commercial high school to finish his course, and is rapidly fitting himself for a place in the business world.

The payment of compensation in such cases will aid seriously injured minors to fit themselves for positions at least as good as those which they would have obtained in the ordinary course of their work in the place of employment in which their injuries were received.

There should, however, be a provision in the law which will give the minor who earns a low rate of wages and who receives permanently disabling injuries a weekly compensation based upon his probable earning capacity at the time he attained the age of twenty-one. Such a statute has been in effect in England since 1906, the English law providing that "during total incapacity of a workman who is under twenty-one years of age at the date of the injury, and whose average weekly earnings are less than 20 shillings, 100 per cent. shall be substituted for 50 per cent. of his average weekly earnings, but the weekly payments shall in no case exceed 10 shillings."

It would be possible to work out a permanent solution of the problem of the minor if it was provided that in such a case, if a minor received a personal injury which permanently incapacitates him, in whole or in part, it shall be conclusively presumed that his average weekly wages are not less than \$10.

The following amendment is suggested: —

Whenever a minor receives a personal injury arising out of and in the course of his employment which permanently incapacitates him in whole or in part for the performance of work, his average weekly wages, for the purposes of this act, shall be conclusively presumed to be not less than ten dollars a week, and compensation shall be paid him on that basis.

THE TAKING OF DEPOSITIONS.

The occasion often arises for the taking of depositions in foreign countries and in other States, and the Board should be authorized, by express legislative enactment, to approve of the taking of such depositions.

An amendment, in effect as follows, is suggested:—

The board or any member thereof may have the power to subpoena witnesses, administer oaths, and to examine such parts of the books and records of the parties to a proceeding as relate to questions in dispute, and shall have the same authority to issue commissions to take depositions within this state as well as in a foreign state or country as the superior court in which a case is pending would have to issue commissions to take depositions regarding any matter pending before it.

THE ACT SHOULD HAVE EXTRA-TERRITORIAL EFFECT.

Many cases have occurred during the past two years in which employees have received serious and fatal injuries, and by reason of the fact that the Workmen's Compensation Act has been passed upon by the Supreme Judicial Court as not having effect outside of the Commonwealth, because the Legislature did not expressly so provide, such employees and their dependents have been deprived of the benefits provided thereunder for similar injuries occurring within the State.

For the purpose of eliminating this defect in the present law the following amendment is proposed: —

Employers who hire workmen within this state to work outside of the state may agree with such workmen that the remedies under this act shall be exclusive as regards injuries received outside this state by reason of such employment, and all contracts of hiring in this state shall be presumed to include such an agreement. Contracts of insurance issued under this act shall be presumed to provide for the payment of the benefits specified to such employees and their dependents.

THE PAYMENT OF COMPENSATION TO PUBLIC EMPLOYEES.

As a result of the application of chapter 807, Acts of 1913, providing for the payment of benefits under the Workmen's Compensation Act to laborers, workmen and mechanics in the employ of the Commonwealth, and the acceptance of that statute by nearly every city, town, county and district in the State by a vote of more than 3 to 1 of its citizens, approximately 60,000 employees have been brought within the jurisdiction of the Industrial Accident Board. The experience of the Board has shown, however, that cities and towns which have not provided by subscribing to insurance for the payment of compensation are lax in their compliance with the statute, despite the expressed willingness of the commission to co-operate with and aid them in every possible way. We recommend that the Legislature amend the Workmen's Compensation Act and place the authority for compliance with this law, which is so important in its bearing upon the families of the army of employees involved, upon an official to be designated by the mayor or other chief authority to perform the duties of adjusting cases under the law. This official should be held responsible to the Industrial Accident Board, in the same manner that insurance companies are held responsible, for the strict carrying out of every provision of the statute. The workmen of the Commonwealth and of the various cities, towns, counties and districts which have so overwhelmingly accepted the Workmen's Compensation Act are entitled to the benefits of the law, and every care should be taken to the end that their rights may be preserved.

The following form of amendment is suggested:—

The commonwealth or any board, commission or department and every city, town, county and district shall, in every case in which chapter eight hundred and seven of the acts of the year nineteen hundred and thirteen, making effective the compensation due under the workmen's compensation act, has been accepted, through its executive officer or board, designate a person to act as its agent in the furnishing of the benefits due under said act and be held responsible for the proper

carrying out of the provisions of such act under the direction and supervision of the industrial accident board; *provided, however*, that this section shall not be applicable if the liability under said chapter is provided for by insurance in a company authorized to transact such insurance in this commonwealth. The name of each official so designated shall be filed with the industrial accident board within thirty days after this act becomes effective.

THE NEED OF MORE INSPECTORS.

The wisdom of giving the Industrial Accident Board a corps of inspectors has been shown by the results accomplished during the past year. The result of the activities of this force of six is to be noted in the impetus which has been given to the movement for accident prevention, the prompt investigation of every complaint, the assistance rendered in the investigation of special cases, and the adjustment of many claims concerning which disputes had arisen, without the expense and annoyance of arbitration or formal hearings. The increase in the number of subscribers to insurance under the law during the year that has just ended, the burden of enforcing the law in its application to the workmen, laborers and mechanics of the Commonwealth, its cities, towns, counties and districts, the necessity for special investigations to determine the right of employees in unusual cases to further medical attendance in the discretion of the Board, and the great need of increased activities in the fertile field of investigation of causes of injuries for which compensation is claimed, make it the duty of the State to add to this inspection staff. A present increase of one woman and one man will suffice.

The following amendment was recommended: —

Section 9, Chapter 813, Acts of 1913. — The industrial accident board may appoint and remove not more than eight inspectors, two of which shall be women, subject to the laws relating to the appointment and removal of employees in the classified civil service. They shall be required to pass examinations of a comprehensive and practical character based upon the particular requirements of the kinds of work to be done, shall be graded in such manner as the board may deem expedient, and shall receive such salaries as the board, with the approval of the governor and council, may fix.

RULINGS AND DECISIONS UNDER THE ACT.

In the second administrative year of the act, there have been decided by committees of arbitration, the Board, and by the Supreme Judicial Court many interesting and important cases. A summary of the most important and valuable decisions made in this period, the year beginning July 1, 1913, and ending June 30, 1914, is printed in this chapter as an indication of the manner in which the act is being interpreted and applied to the cases which arise for settlement.

Explanation of Certain Changes in the Law. — It should be remembered, in connection with the reading of the digest of cases here published, that the law has been amended in certain important particulars, to take effect after the decisions in point indicated the necessity for these amendments. Hereafter, a wife who is living apart from her husband for justifiable cause at the time of the injury will be entitled to be "conclusively presumed to be wholly dependent for support." The words "or casual" have been stricken from the statute, so that all employees engaged in the usual course of the trade, business, occupation or profession of their employer, except masters of and seamen on vessels engaged in interstate or foreign commerce, will receive compensation. These amendments nullify the Supreme Judicial Court's decisions in the Gallagher and Gaynor cases, respectively.

The Supreme Judicial Court as a Beacon Light. — The Supreme Judicial Court, in its capacity as the court of last resort, has passed upon a large number of cases on appeal since the first year of the act. Almost without exception it has affirmed the finding of the Industrial Accident Board, and the light which may be had by a perusal of the accompanying digest will give the reader an idea of the principles which underlie the decisions, as enunciated by the supreme judicial body.

Acceleration of Previously Existing Heart Disease to a Mortal End sooner than Otherwise is a Personal Injury. — The striking sentence in the decision of the Supreme Judicial Court

in the Brightman case is the following from the pen of Rugg, C.J.:—

Acceleration of previously existing heart disease to a mortal end sooner than otherwise it would have come is an injury within the meaning of the Workmen's Compensation Act.

Brightman's Case stated briefly.—The employee was a cook upon a "lighter." The vessel began to sink at the dock, and he made several hurried trips to and from the vessel in an attempt to save some of his clothing. Previously he had suffered from valvular heart disease, and his exertion in the effort to save his belongings so aggravated the heart weakness as to cause his death.

The Saving of his Clothing was a Reasonable Act.—The court held that Brightman was within the scope of his employment in his endeavor to save his clothing, and that it was an implied term of his contract of service to use reasonable effort to this end in an exigency like that which arose.

The court states:—

The perils of the sea were risks arising out of and in the course of the employment of the deceased. The sinking of the boat obviously was one of these perils. It is impossible to say as a matter of law that it is not one of the instincts of our common humanity to try to save from a sinking vessel all of one's possessions that reasonably can be secured.

Death results from the Injury when Chain of Causation is not broken by a New Intervening Act.—In the Burns case the court held that the death of the employee from septicæmia was due to the injury, since no new intervening cause had broken the chain of causation connecting the injury with death.

Additional Compensation for Specific Injury ceases at Death.—The employee, in the Burns case, had suffered the permanent incapacity of both legs by reason of the injury, and his dependent claimed that the "additional compensation" due therefor should continue until the end of the period of one hundred weeks, as provided by the statute. The court held that "this special compensation ceases with the death of the

person injured," and that "it is a right peculiar to himself, not created for the benefit of his dependents."

Additional Compensation on Account of Specific Injuries may not be deducted when Death ensues. — The court held, in the Nichols case, that the "additional compensation" paid the employee, before death, on account of the specific injury to the third finger of his right hand, should not be deducted from the compensation awarded his widow.

Plain Words should be given their Ordinary Signification. — The language of the court, in connection with the Nichols case, is significant: —

The statute not having been designed to promote but to decrease the opportunity for unnecessary litigation, its purpose will be best subserved if plain words are given their ordinary signification; and no provision being found in section 6 for any deduction of this amount, the widow as the sole dependent is entitled to compensation from the date of the accident.

Injury to Employee while engaged in performing the Work that he was hired to do covered by the Statute. — The court held, in the Howard case, that the injury to the employee, who was engaged in trimming a tree on church property, having no connection with the work of the subscriber, was covered, since "Howard was employed to trim trees, and was to receive his orders from the company through Kennedy. It was no part of his business to inquire into the right of the company to trim any particular tree. He was to receive his orders from Kennedy and to obey them. At the time he was hurt he was doing what he had been hired to do." Kennedy, the foreman, also was the tree warden of the town of Stoughton, and ordered the employee to trim the tree upon which the injury occurred. The insurer claimed such employment was "casual" and not "in the usual course of the trade, business, profession or occupation" of the company.

Lead Poisoning by Absorption a "Personal Injury." — The employee, in the Johnson case, had been absorbing lead poisoning during his occupation for a period of twenty years, eight months of which period were within the time that the Work-

men's Compensation Act was effective. Finally, he became incapacitated for work by reason of the lead poisoning, and it was held to be a "personal injury" under the act. The Supreme Judicial Court held that the Board was right in its findings that lead poisoning was a "personal injury;" that the date of such personal injury was the day upon which the employee first became incapacitated for work; and that said personal injury arose out of and in the course of Johnson's employment. The court referred to its decision in the Hurle case as more fully covering its reasons for deciding that injuries other than by visual contact or direct lesion are within the scope of the compensation statute.

Bodily Harm caused by Noxious Vapors is a "Personal Injury." — In the Hurle case the Supreme Judicial Court gives a broad construction to the words "personal injury" as used in the act, stating that there is nothing in the language of the statute which leads to the conclusion that it was there used in a narrow or constricted sense. It is stated that these words, "personal injury," have been held to be broad enough to include a husband's right to recover for damage sustained by bodily harm to his wife, the alienation of a husband's affection, the seduction of one's daughter and other kindred tortious acts. At common law the incurring of a disease or harm to health is such a personal wrong as to warrant a recovery if the other elements of liability for tort are present.

The court states that the case of *Hood & Sons v. Maryland Casualty Company*, 206 Mass. 223, goes far toward deciding the case at bar. In that case it was held that the employee, who had become infected by glanders while cleaning a stable, was entitled to damages. The court sums up:—

The noxious vapors which caused the bodily harm in this case were the direct production of the employer. The nature of the workman's labor was such that they were bound to be thrust in his face. The resulting injury is direct. If the gas had exploded within the furnace and thrown pieces of cherry-hot coal through the holes into the workman's eyes, without question he would have been entitled to compensation. . . . There appears to be no sound distinction in principle between such case and gas escaping through the holes and striking him in the face, whereby through inhalation the vision is destroyed.

Nature and Conditions of Employment must make it likely that Personal Injury is likely to happen. — The fact that an employee receives an injury, as in the Milliken case, by reason of his effort to get a horse and wagon to the stable, goes no farther than to show that such injury was received “in the course of his employment.” In order to hold that the injury arose “out of” his employment, it must be shown that the nature and conditions of the employment were such that the personal injury which in fact happened was one likely to happen to an employee in that employment. The court says: —

There is nothing in the employment of driving a wagon which makes it likely that the employee will alight from his wagon, wander to and fall into a swamp, and lie there all night. . . . If the horse driven by Milliken had run away and Milliken had been thereby thrown out and killed, the personal injury in fact suffered in that case would have been one which from the nature of his employment would be likely to arise, and so would be one “arising out of his (the employee’s) employment.” But, as we have said, there is nothing in the employment of driving a wagon which makes it likely that the employee will alight from his wagon, wander to and fall into a swamp, and lie there all night. . . . It seems plain that if Milliken’s death was caused by a personal injury, it was one which happened some four or five years before the occurrence here complained of and before the Workmen’s Compensation Act was passed. At that time he fell from his wagon, and striking on his head suffered as a result “an impairment of his memory.”

Employee who receives Injury while using Common Stairway not under Control of her Employer entitled to Compensation. — In the Sundine case the employee received a personal injury while going down a flight of stairs of the building in which she was employed to perform her work for an independent contractor of the subscriber. There was no other way by which she could go to the street except down the stairway on which she was injured. Neither the independent contractor nor the subscriber had control of the stairs, though they and their employees had the right to use them. The court says: —

It was a necessary incident of the petitioner’s employment to use these stairs. We are of the opinion that, according to the plain and natural meaning of the words, an injury that occurred to her while she was so using them arose “out of and in the course of” her employment.

Injury on Railroad Tracks after Working Hours not covered.

— The court held, in the Fumiciello case, that the employee, who was compelled, by reason of the fact that he lived at a certain boarding house, to go to and from his place of employment by means of the railroad track, and who was fatally injured while so doing, was not within the scope of his employment.

The court states: —

The contract of employment did not provide for transportation or that he should be paid for the time taken in going and returning to his place of employment, and when the day's work had ended the employee was free to do as he pleased. If he had chosen to use the public ways, and had been injured by a defect or passing vehicle, the administrator could not recover against the employer because there would be no causal connection between the conditions of employment and the injuries suffered.

Serious and Willful Misconduct defined. — The court, in the Burns case, defines serious and willful misconduct, as follows: —

Serious and willful misconduct is much more than mere negligence, or even than gross or culpable negligence. It involves conduct of a quasi-criminal nature, — the intentional doing of something either with the knowledge that it is likely to result in serious injury or with a wanton and reckless disregard of its probable consequences.

Serious and Willful Misconduct by Employee must be a Deliberate Act. — In the Nickerson case the court held, with the Industrial Accident Board, that his decision to continue his work as a whitewasher, instead of waiting until the machinery had shut down, was “more like a sudden thought than a willful act. It seems that it should fairly be regarded as a minor transgression, at most, from his standpoint, and not as ‘serious and willful misconduct.’” The court adds: —

The fact that the injury was occasioned by the employee's disobedience to an order is not decisive against him. To have this effect, the disobedience must have been willful, or, as was said by Lord Loreburn, in *Johnson v. Marshall Sons & Co., Ltd.* (1906), A. C. 409, 411, “deliberate, not merely a thoughtless act on the spur of the moment.”

Employee's Transportation an Incident of his Employment.

— In the Donovan case the employee, in accordance with his usual custom, was riding home in a vehicle furnished by his employer, when he received the personal injury which incapacitated him. The Board found that such transportation was incidental to his employment, and the Supreme Judicial Court affirmed the finding. The court says: —

The finding of the Industrial Accident Board, that Donovan's transportation was "incidental to his employment," fairly means, in the connection in which it was used, that it was one of the incidents of his employment; that it was an accessory, collateral or subsidiary part of his contract of employment, — something added to the principal part of that contract as a minor, but none the less a real feature or detail of the contract. Whatever has been uniformly done in the execution of such a contract by both of the parties to it well may be regarded as having been adopted by them as one of its terms. Especially is this so where none of the provisions of the contract have been shown by either party, but everything is left to be inferred from their conduct.

Employee who fails to obtain Employment by Reason of Incapacity due to Injury entitled to Compensation on Basis of Total Incapacity for Work. — The Supreme Judicial Court, in the Sullivan, Duprey and Stickley cases, affirms the findings and decisions of the Industrial Accident Board that, under the statute, an employee who is unable to obtain any employment by reason of incapacity due to the injury is entitled to compensation on the basis of total incapacity for work.

The language of the court in the Sullivan case gives effect to the principle upon which these cases were decided, and is, in part, as follows: —

The object of our statute was to give compensation for a total or partial loss of the capacity to earn wages. (Gillen's Case, 215 Mass. 96, 99.) If, as in this case, the injured employee, by reason of his injury, is unable, in spite of diligent efforts, to obtain employment, it would be an abuse of language to say that he was still able to earn money, — that he still had a capacity for work, even though his physical powers might be such as to enable him to do some kinds of work if practically the labor market were not thus closed to him. He has become unable to earn anything; he has lost his capacity to work for wages and to support himself; not by reason of any change in the market conditions, but because of a defect which is personal to himself.

and which is the direct result of the injury that he has sustained. He is deprived of the benefit which the statute promises to him if he is told that because he could do some work if he could get it he is not under an incapacity for work, although by reason of his injury he can obtain no opportunity to work.

Finding that Normal Use of the Hand was wholly gone equivalent to Decision that Hand is incapable of Use. — Meley, the employee, received a serious injury to the right hand by reason of which that member was permanently disabled; also, the little finger of the left hand was so injured as to be incapable of use. The Board awarded compensation on account of total incapacity for work, and also ordered the insurer to pay specific compensation for sixty-two additional weeks, fifty weeks on account of the injury to the right hand and twelve weeks because of the incapacity for use of the little finger of the left hand. The court says: —

The hand was cut across and most of the flexor tendons were severed. Those in the thumb were cut. A physician testified that the hand was permanently disabled. . . . Certainly it could be found that the normal use of the hand was wholly gone, and that the hand was “so injured as to be incapable of use.” The incapacity of use need not be tantamount to an actual severance of the hand; it is enough that the normal use of the hand has been taken entirely away.

Each Hand should be considered separately. — The insurer also raised a question as to the right of the Board to award specific compensation for each hand separately. The court held, however, that each hand should be considered separately, and the specific compensation due “in addition to all other compensation” awarded on that basis.

Mother and Sister having no Other Source of Income are wholly dependent upon the Employee. — In the Caliendo case the Supreme Judicial Court affirmed the findings of the Board by which total dependency compensation was awarded the mother and sister of the employee, who had no other source of income except his earnings. The court states: —

The evidence shows that they are residents of Italy, and having become unable by reason of failing eyesight to follow their usual occupations were forced to rely wholly upon him for the means of sub-

sistence. The insurer, however, contends that the 6 or 7 cents a day earned by another sister who was a member of the family, and the remittances from time to time to the mother of various sums by an aunt of the decedent, were sufficient to take the case out of the statute. But the findings, that the remittances were mere gratuities, and that the pittance earned by the sister was hardly sufficient for her own maintenance, and that no part was paid to the dependents who never relied upon either for aid, eliminates those relatives as contributing any dependable sources of support. It being plain on the facts that during his life the mother and sister had no other source of income except his earnings, they were rightly found to be wholly dependent upon the employee, and the rulings requested could not be given.

Permanently Disabled Employee, receiving Partial Compensation, entitled to Total Incapacity Compensation during Shut-down Period. — The court held, in the Septimo case, that the employee was entitled to compensation on the basis of total incapacity for work during a certain period of time, while the plant in which he had been furnished employment was shut down.

The court states: —

The committee of arbitration found that it was probable, considering his injured condition, that he would not have been able to obtain work or to earn anything elsewhere. The record shows that he was seriously crippled and disabled. The photograph, which is annexed to and made part of the report of the Board, shows that he has lost the whole of every finger, except the forefinger of his right hand and the little, or fourth, finger of his left hand. When the grave character of these injuries is considered we cannot say, without the evidence before us, that the finding of total disability for work of the employee was not warranted. It follows that the amount which he would have been entitled to receive for partial incapacity for work becomes immaterial and need not be considered.

Daughter Physically Able to earn, in Fact totally dependent. — The Board decided as a fact that the daughter of the deceased employee, Herrick, although physically able to earn, was totally dependent upon him for support. The court says: —

That but for her sense of duty, because she thought that her father needed her care, she might have continued to earn enough for her own support, and to be independent of him, cannot be decisive as a matter

of law against her claim. The Board well might base its conclusions upon the facts as they were, and not upon what might have been the case if her sense of filial duty had been weaker.

No Appeal from Finding of Board if there is Any Evidence to support it. — In the Buckley case the court states: "There is no appeal from the finding of the Board upon a question of fact where there is any evidence to support it; but where, as here, the evidence is all reported, the question whether it is sufficient to support the finding is one of law and may be revised here." After reviewing the case the court finally adds: "It cannot be said as a matter of law that such a conclusion is erroneous," that is, the conclusion of the Board on the evidence that the claimant was wholly dependent.

Dependency is a Question of Fact unless the Claimant comes within the Conclusive Presumption Clause. — The court held, in the Gallagher case, that a wife who was living apart from her husband at the time of his death for justifiable cause, and who had endeavored in every possible way to secure the support to which she was entitled, was not entitled to be "conclusively presumed to be wholly dependent" upon him for support, deciding that, under such circumstances, dependency is a question of fact. A recent amendment to the act gives a wife who lives apart for justifiable cause the benefit of the "conclusive presumption" clause.

Dependency is a Question of Fact in all but Excepted Cases. — The court held, in the Bentley case, that findings of fact by the Board are not open to revision, and that dependency is a question of fact which must be determined upon evidence of the facts as they existed at the time of the injury. The Board found that the widow, living apart from her husband and not receiving support from him at the time of the injury, was not entitled to compensation. It found that a minor child, also living apart with her mother, was in fact partially dependent upon the employee, and awarded compensation in accordance with the evidence as to such partial dependency.

The Value of Employee's Board should not be deducted in determining Dependency Status of Claimant. — The court adopted the reasoning of the Board in the Murphy case, in

which it was held that "there is no provision in the act which provides for any deduction from an employee's wages when the employee contributes to the dependent all of his wages," and states:—

This statute was the beginning of a new kind of legislation, and was dealing with a class of cases involving an infinite variety of circumstances. The Legislature may well have thought that it was not wise to attempt at first to provide a specific rule for every possible case, but simply to provide a few general rules easily understood and easy of application and, as experience dictated, from time to time to make changes. In the present case the father had a large family which he was legally bound to support, and this he was bound to do, whether the children could help or not. The amount contributed by Walter went to help the father in the support of the whole family. Whether it is wise to distinguish as to the support of the individual members of a family in a case like this, as the insurer suggests, is for the Legislature. We think that the conclusion of the Accident Board is in accordance with the language of the statute.

Release by Employee does not deprive Widow of Right of Recovery after Death.—The employee in the Cripps case had signed a release in consideration of the receipt of a small sum of money, having elected to take damages from the independent wrongdoer rather than to receive compensation under the statute. Later, however, complications due to the original injury developed and he died. The widow, claiming a right of recovery independent of the employee's control, asked for compensation on account of his death. The court says:—

The statute of 1911, chapter 751, is not penal, but is based on the theory of compensation. Primarily its object is to provide, in place of wages which he can no longer earn, the means of subsistence for the employee injured without "serious and willful misconduct" on his part, if he survives, or for the widow, and other dependents, if death ensues either with or without conscious suffering. . . . The right of recovery expressly given to his widow cannot accrue until his death. Having been created for her benefit, it is independent of his control, and under section 22 can be discharged only by herself where she is the sole dependent, or by those authorized to act in her behalf.

The Word "furnish" in Connection with Medical and Hospital Treatment defined by Supreme Judicial Court. — The Board held, in the Panasuk case, that the insurer must pay the reasonable medical fee of a physician selected by the employee to treat him, unless it makes some degree of active effort to furnish medical attendance, and the court, upholding the decision of the Board, defines the word "furnish," as used in the statute with reference to medical and hospital attendance, as follows: —

The obligation to furnish medical and hospital services for the first two weeks after the injury is imposed on the insurer by the express words of the act. This duty must be performed, or reasonable efforts made to that end, before the statutory obligation is satisfied. "Furnish" means to provide or supply. Its significance may vary with the connection in which it is found. It is used here to describe a duty placed upon an insurer respecting a workman who receives "a personal injury arising out of or in the course of his employment." Such a person manifestly is presumed by the act to be under more or less physical disability, and hence not in his normal condition or ability to look out for himself. The word "furnish" in such connection imports something more than a passive willingness to respond to a demand. It implies some degree of active effort to bring to the injured person the required humanitarian relief. Reasonably sufficient provision for rendering the required service must of course be made. Then either express notice must be given to the employee, or there must be such publication or posting of the information as warrants the fair inference that knowledge has reached the employee. If the insurer has made adequate arrangements for the care of those to whom the duty is owed in the event of injury, and then by conspicuous notices suitably posted in places frequented by the employee, in a language capable of being read by him, has given full information of that fact, and directions as to steps to be taken by an injured person in order to avail himself of these arrangements, a very different question would be presented. This might go a long way toward proving compliance with the requirement of the statute.

Purpose and Scope of Workmen's Compensation Act is to include all Matters arising under it. — The insurer, in the Panasuk case, objected to the taking of jurisdiction by the arbitration committee and Board to the claim of the employee on account of the nonpayment of the bill of his physician. The court states: —

It is contended that the arbitration committee and the Industrial Accident Board have no jurisdiction to consider this question. That contention is untenable. The purpose and scope of the Workmen's Compensation Act is to include all matters touching the relations between the employer and employee arising under the act. It is a remedial statute and should be given a broad interpretation. All controversies arising between the employee and the employer and the insurer under the terms of the act are to be settled in accordance with the procedure there established.

Finding of the Board on Question of Fact has Weight and Effect of Verdict of Jury. — The Supreme Judicial Court, in the Diaz case, says: —

The contention of the insurance company is that the employee did not suffer any injury which would incapacitate him beyond the first two weeks. But the finding of the Industrial Accident Board on that question of fact has the weight and effect of the verdict of a jury. Clearly, we cannot say that the facts stated in the report do not warrant the finding of the Board as to the extent of the employee's incapacity, especially in view of the report of the duly qualified impartial physician that in his opinion the injured employee was not malingering, and that ten weeks' idleness was not due to dishonesty or laziness or a hope of gain.

Board has Right to leave Case open, pending the Establishing of the Earning Capacity of Employee. — The insurer contended, in the Hunnewell case, that the Board exceeded its authority in making a finding that the employee's total incapacity for work terminated at a certain date "subject to the right of the said employee to compensation on account of partial incapacity for work under section 10, Part II. of the Workmen's Compensation Act, depending upon his ability to earn wages." The Board had made an award on account of partial incapacity for work on the basis of the employee's earning capacity, and the insurer, objecting thereto and claiming an excess of jurisdiction, appealed to the Supreme Judicial Court for relief. The court says: —

This course is justified by the act. . . . There is nothing in the words of our act which prevents the Board from pursuing this course. The procedure should be flexible and adapted to the direct accomplishment

of the aim of the act, with as little formality or hampering restriction as is consistent with the preservation of the real rights of the parties and the doing of justice according to the terms of the act. It is within the power of the Board to decide that for a time compensation shall be suspended but not ended, with reservation to leave to the employee to apply for further payments under the act, provided this course in its opinion is required by the facts.

Insurer may not litigate by Appeal when Decision will not affect its Pecuniary Responsibility. — The Supreme Judicial Court held, in the Janes case, that the insurer has suffered no harm by the finding of the Board, which directs the administrator of the deceased employee to divide the compensation between the guardian of the living minor child and the administrator of the estate of a minor child whose death occurred subsequent to the demise of his male parent. The court says: —

The Workmen's Compensation Act does not contemplate, either in its letter or its spirit, that the insurer may litigate by appeal to this court the proportions of the division of a payment among those claiming to be dependent upon the deceased employee, when the dependents are satisfied, and do not appeal, and when the insurer cannot, by any possibility, be affected in its pecuniary responsibility by any modification permitted by law of the order for payment.

Employment for One Occasion and for Single Day is "Casual." — The Supreme Judicial Court held, in the Gaynor case, that employment for a single day, and for one occasion only, was "casual" employment. While this decision is no longer of importance in Massachusetts, because of the striking out of the word "casual" from the act, reference is made thereto because other States except "casual employees" from the operation of the law. The court states: —

The relation between the waiter and the caterer had no connection of any sort with any events in the past. Each was entirely free to make other arrangements for the future, untrammelled by any express or implied expectation of further employment. . . . The conclusion seems irresistible that the employment of the deceased was "but casual" within the meaning of those words in our act.

Later the court held that the above decision was controlling in the Cheevers case.

Supreme Judicial Court defines "with whom she lives." — In the Nelson case the Supreme Judicial Court defines the words "with whom she lives," as used in the statute, Part II., section 7, as follows: —

"With whom she lives" in (a) means living together as husband and wife in the ordinary acceptation and significance of these words in common understanding. They mean maintaining a home and living together in the same household, or actually cohabiting under conditions which would be regarded as constituting a family relation. There may be temporary absences and incidental interruptions arising out of changes in the house or town of residence, or out of travel for business or pleasure. But there must be a home and a life in it. The matrimonial abode may be a roof of their own, a hired tenement, a boarding house, a rented room, or even a room in the house of a relative or friend, however humble or temporary it may be. But it is the situation arising from the existence of a common home, a place of marital association and mutual comfort broken up or put in peril of hardship or extinction by the husband's death, which is protected by the conclusive presumption of dependency established beyond the peradventure of dispute by the statute. Under such circumstances the widow is given the benefit of an irrefutable assumption that she was supported by the husband. The correlative provision in sub-section (b), giving the husband the benefit of a like presumption, confirms this view.

After making reference to the English act and to the recognized benefit to society arising from the living together of husband and wife, the court adds: —

There may be many instances where there is a total dependency, although there is a temporary separation of husband and wife. There may be a physical dissociation and a breaking up of the home, with a definite purpose to resume the normal conditions of married life. The act provides for these cases by requiring dependency to be determined in accordance with the truth. But the words "living together" do not aptly describe such a situation. These words are used in antithesis to living apart. They exclude a condition where there is neither a home nor an actual dwelling together, and where the suspension of this relation is something more than a mere temporary incident of a changing family habitation.

A Farmer may or may not insure, as he elects. — The Supreme Judicial Court upheld the decision of the Board in the Keaney case, in which it was decided that a farmer may or may not, as he chooses, insure any part of or all of his employees under the Workmen's Compensation Act. The court says: —

The Workmen's Compensation Act was not intended to confer its advantages upon farm laborers, or to impose its burdens upon farmers. . . . A farmer employing laborers suffers no harm in not undertaking to become a subscriber under the Workmen's Compensation Act. Hence, it is apparent that a farmer who chooses to avail himself of its terms, and thereby confers the boon of its protection upon his employees, does so on other grounds than those which might actuate the manufacturer or other employer of labor. . . . There appears to be no reason for saying that a farmer may not adopt it if he desires. Any contract of insurance made by him under its terms is valid and enforceable. On the other hand, if he does not desire to make it available for all of his employees, there is no insuperable objection to his undertaking an insurance for a limited portion of them. If there are those, separable from others by classification and definition, whose labor is more exposed or dangerous, or whom he may desire to protect for any other reason, there is nothing in the act reasonably interpreted to show why he may not do so. [The court adds:] If construed to compel farmers to insure for all their laborers if they undertake to insure any of them, the inevitable tendency would be to discourage resort to the act in any respect.

The Importance of the Supreme Judicial Court's Decision in the Young Case. — The Young case, as decided by the Supreme Judicial Court, is important in three particulars: it has been decided again that the Workmen's Compensation Act is constitutional, that the insurer's course in asking for the formation of a committee of arbitration, notwithstanding the objection of the employee, was warranted, and that the failure of a subscriber to insurance to give notice of this fact to his employees does not give such employees a right of action at common law.

With regard to the constitutionality of the act, the court states: —

It is urged that it deprives the plaintiff of her constitutional right to a trial by jury. If that question is presented and insisted upon, undoubtedly an employee has a right to a trial by jury on the point

whether the employer was in truth a subscriber under the act, and whether notice had been given by the employee at the time of the contract of hire of an election to rely upon his common-law rights in cases where claim is asserted that such notice had been given. . . . The section in question affects no existing property right. It deals with no property right after it has come into being. It affects a situation which antedates any property right arising out of tort. It simply established a status between subscribers under the act and their employees in the absence of express action by the latter manifesting a desire to elect a different status. . . . The employee is not compelled to give up any common-law or constitutional right. It is a matter of choice whether he avails himself of the one or the other. Reasonable provisions are made for the exercise of his election. The section is not open to objection as class legislation, or as denying equal protection of the laws. It applies to all employees alike. . . . The act is constitutional and is not open to criticism in the respects urged by the plaintiff.

Severance of Phalange and Permanent Incapacity of Phalange differentiated. — The court modified the decision of the Board in the Ethier case by holding that the statute, as then in effect, contained no reference to the permanent incapacity of an injured phalange, and held, therefore, that “a construction cannot be adopted placing upon a parity the severance of a phalange with an injury to the phalange not resulting in the permanent incapacity for use of the entire finger.” A recent amendment provides for the payment of “additional” compensation for the permanent incapacity of a phalange.

Plaintiff entitled to recover for Loss caused by Injury to Minor. — The court held, in the King case, that the plaintiff was entitled to recover for the loss caused to herself by the injury to her minor son.

The court says: —

Our decision does not apply to cases where the parent has received any benefit or compensation under the act. Nor do we decide that the plaintiff could recover for medical expenses which had been paid by the insurer, or for her son's services, so far as she had received, or was entitled and able to obtain, for such services the amounts paid therefor to him through his next friend by the insurer. These questions are not presented, for the amount of damages has been agreed upon.

Court has no Power to issue Letters Rogatory. — The court decided, in the Martinelli case, that it had no power to issue letters rogatory for the purpose of taking the testimony of witnesses in a foreign country.

The court says: —

It is not within the power of a court, even of general jurisdiction, to issue letters rogatory to obtain testimony to be used before a tribunal over whose procedure and trials it is given no authority until the case itself may be brought before it for review.

Important Decisions of the Board. — Many of the important decisions of the Industrial Accident Board were not taken by appeal to the Supreme Judicial Court, and some of those which were have not been decided to date by that body. Immediately following will be found a summary of many of the important decisions of the Board, a perusal of which will prepare the reader for the study of the complete reports which may be located by reference to the case index.

Frostbite results from Materially Increased Exposure. — It was held, in *Doherty v. Employers' Liability Assurance Corporation, Ltd.*,¹ that frostbite, resulting from materially increased exposure, due to the shoveling of coal on a very cold day, was covered under the statute.

Compensation due under Statute a Vested Interest. — The dependent mother, having died since the hearing before the committee of arbitration, the Board held, in *Murphy v. Ætna Life Insurance Company*,¹ that the compensation due her under the statute is a vested interest and passes to her estate.

Incapacity due to Compulsory Vaccination. — The employee was vaccinated as the result of a requirement by the board of health, in the factory of his employer. Infection, followed by ulcer, resulted from the vaccination, and the employee was incapacitated for work for a period of nine weeks. Held, in *Fewore v. Employers' Liability Assurance Corporation, Ltd.*,¹ that he was entitled to compensation.

Tips or Gratuities are Earnings. — The employee, in *Hatchman v. New England Casualty Company*, was a waiter, and received in addition to his wages and meals certain tips or

¹ Appealed to Supreme Judicial Court.

gratuities from the patrons of the hotel. Held, that tips or gratuities are earnings, and that employee's compensation should be based upon all his earnings.

Compensation awarded for Certain Period, after which All Incapacity will be due to Natural Effects of Pre-existing Disease. — In *Jones v. Fidelity and Deposit Company of Maryland*,¹ compensation was awarded for a certain period, after which it was held that all incapacity will be due to the natural effects of a pre-existing disease.

Loan of Employee does not change Employment Status. — The employee was assigned, or loaned, to assist a contractor to erect a tank for the use of the subscriber, and it was held, in *Steiner v. Casualty Company of America*, that his status of employment had not been changed by reason of this assignment.

Employment Status unchanged by Another's Agreement to furnish Financial Aid. — The subscriber, in *Schuman v. Employers' Liability Assurance Corporation, Ltd.*, needed and received financial assistance from another, and it was held that there was no change in the employment status of the deceased employee.

Insanity having Causal Relation to Injury. — The employee received a personal injury by reason of the blistering of his hands while using a wheelbarrow; the wound became infected and two operations were performed; because of the injury, operations and suffering the previously impaired nervous state of the employee was accelerated to the point of insanity. Held, in *Whalen v. United States Fidelity and Casualty Company*, that the employee was entitled to compensation.

Insanity and Suicide have Causal Relation to Injury. — The employee received a personal injury by reason of the spattering of molten lead into his eye, causing total loss of vision in the injured eye. Subsequently, in a fit of insanity, he threw himself from the hospital window and received injuries which caused his death. Held, in *Sponatski v. Standard Accident Insurance Company*,¹ that the employee's widow was entitled to compensation.

¹ Appealed to Supreme Judicial Court.

Personal Injury causes Nephritis and Blindness. — It was held, in *Cooper v. Massachusetts Employees Insurance Association*, that the nephritis and blindness which incapacitated the employee were caused by the injury and electrical shock which he received while performing his work for the subscriber.

Personal Injury lights up Inflammatory Condition. — The employee received a personal injury by reason of a blow from a 12-pound sledge hammer which he was using, which lighted up an inflammatory condition which had been described as a mild chronic osteomyelitis. This lighting up of the old condition necessitated amputation of the leg. Held, in *Gariella v. American Mutual Liability Insurance Company*, that this was a personal injury under the statute.

Traumatic Cataract to Right Eye sympathetically affects Left Eye. — Compensation was awarded, in *Stachuse v. Fidelity and Casualty Company of New York*, because of the sympathetic affection of the left eye, by reason of a condition of traumatic cataract of the right eye, due to a personal injury arising out of the employment.

Heart Lesion grows progressively Worse dating from Injury. — In *O'Hare v. Employers' Liability Assurance Corporation, Ltd.*, the condition of heart lesion grew progressively worse, dating from and by reason of the occurrence of the injury, and compensation was awarded.

Lobar Pneumonia follows Reduced Powers of Resistance. — The employee, in *Merritt v. Travelers Insurance Company*, died from lobar pneumonia, due to exhausted vitality and reduced powers of resistance, following a personal injury arising out of and in the course of his employment, and compensation was awarded the widow.

Hypostatic Pneumonia follows Injury and Operation. — The employee, in *Cantwell v. Travelers Insurance Company*, slipped and fell while employed in the bottling department of the subscriber, dislocating the clavicle. He was operated upon three days later, and died of hypostatic pneumonia caused by the weakening of his system by reason of the operation. Held, that his widow was entitled to compensation.

Previous Condition of Tuberculosis not aggravated by Ex-

posure. — The Board, in *Fralin v. United States Casualty Company*, found that the condition of tuberculosis from which the employee was suffering was not materially aggravated or accelerated by his exposure during his employment in an unoccupied house.

Condition of Diabetes has no Causal Connection with Injury. — It was held, in *Gacuzzi v. Employers' Liability Assurance Corporation, Ltd.*, that the sudden wrench and strain sustained by the employee, with the resulting fall, did not materially accelerate an incipient condition, and therefore that there was no causal relation between the injury and the diabetes.

Condition of Dementia Præcox has no Relation with Injury. — The employee received a personal injury by reason of a fall to the floor from the bench upon which he was working, and later became incapacitated for work because of a condition of dementia præcox. Held, in *Lederman v. Standard Accident Insurance Company*, that there was no causal relation between injury and dementia præcox.

Chain of Causation broken by a Novus Actus Interveniens. — The evidence, in *McCarthy v. London Guarantee and Accident Company, Ltd.*,¹ showed that the employee received a personal injury which necessitated the amputation of the thumb and fingers of his right hand. Later, alcoholic insanity developed and totally incapacitated him. Held, that the employee was not entitled to compensation.

Pin Prick has no Relation to Death from Pneumonia. — It was held, in *Currie v. Royal Indemnity Company*, that a pin prick and subsequent sepsis had no causal relation with the death of the employee from pneumonia at a later date.

Cerebral Hemorrhage, not Injury, causes Death. — The employee, in *Birnie v. Contractors Mutual Liability Insurance Company*, died from cerebral hemorrhage, having no causal connection with personal injury. The evidence of fellow employees who witnessed the occurrence was wholly at variance with the weight of the medical testimony. Impartial autopsy shows that there was no causal relation between injury and death, and committee so decided.

¹ Appealed to Supreme Judicial Court.

Cancer from which Employee dies has no Relation to Injury. — The medical evidence showed that the condition of cancer from which the employee died had no relation to the personal injury received by the employee by reason of a blow from a timber, and it was so held in *McElligott v. Frankfort General Insurance Company*.¹

Bronchitis and Intestinal Tuberculosis cause Incapacity Independent of Injury. — The employee fell ten feet, striking on his left arm near the elbow. Afterwards he felt, in addition to trouble in arm and shoulder, a soreness in the left side of the chest. Subsequently, a condition of bronchitis and intestinal tuberculosis developed. Held, in *Swartz v. Casualty Company of America*,¹ that there was no causal relation between the diseases which incapacitated him and the injury.

Injury occurs while entering Place of Employment. — In the case of *Driscoll v. London Guarantee and Accident Company, Ltd.*,¹ it was held that an employee who was required to use the flight of stairs upon which she received the injury in order to enter her place of employment was entitled to compensation.

Employee voluntarily leaves Work to assist Fellow Employee. — The Board held, in the case of *Malewicki v. American Mutual Liability Insurance Company*, that the widow of an employee who received a fatal injury by reason of the voluntary leaving of his own work to assist other workmen in loading a heavy heater coil on a flat car was entitled to compensation.

Street Cleaner receives Injury by Reason of running away of a Horse. — The Board awarded compensation to the widow of a street sweeper who received a fatal injury by reason of the running away of a horse, it being held that the duties of his occupation especially exposed him to the risks and dangers of the street. This was the case of *Lowney v. City of New Bedford*.

Employee receiving Injury while assisting Another in removing Paint placed on Spindle in Spirit of Play. — The Board held, in *McHenry v. American Mutual Liability Insurance Company*,¹ that a personal injury received by an employee

¹ Appealed to Supreme Judicial Court.

while assisting another employee to remove paint placed on a spindle in a spirit of play did not arise out of or in the course of her employment. The painting was done just before lunch time, and the removal of the paint was performed during the luncheon hour. The Board stated that it was neither incidental to said employment, nor any part of the duty of the said employee, to paint spindles or to remove paint from such spindles.

Fatal Injury occurs after Employee makes Unsuccessful Application for Work. — The evidence in the case of *Ganley v. Employers' Liability Assurance Corporation, Ltd.*, shows that the employee, a longshoreman, had finished his work at 7 o'clock on the night before the fatal injury occurred. He made an unsuccessful application for employment the next day, and while crossing the railroad tracks was killed by a passing train. Held, that the injury did not arise out of and in the course of his employment.

On the Premises for Purposes of his own. — The employee, in the case of *Lynn v. Employers' Liability Assurance Corporation, Ltd.*, was on the premises for purposes of his own at the time the injury occurred, and it was held that no compensation was due under the statute.

Fibroid Tuberculosis, or Stone Grinder's Phthisis, causes Death of Employee. — It was held by a committee of arbitration, in the case of *Kalanquin v. Travelers Insurance Company*, that the occurrence of fibroid tuberculosis, or "stone grinder's phthisis," by reason of the inhaling of small particles of stone and dust, is a personal injury arising out of and in the course of the employment.

Unusual Degree of Strain causes Occupational Neurosis. — The employee, in the case of *Lee v. Employers' Liability Assurance Corporation, Ltd.*, was incapacitated for work by reason of a condition of occupational neurosis, due to the unusual degree of strain upon certain groups of muscles for a long period of time at his trade of cigar maker. Compensation was awarded for the incapacity for work resulting thereby.

Employee unable to perform Work provided. — The employee, in *Krulla v. Casualty Company of America*, was furnished certain employment which he was unable to perform.

and was thereafter unable to obtain any employment which he could perform, because of the incapacity due to the injury. Held, that he was entitled to compensation on account of total incapacity.

Unreasonable Refusal to perform Work offered. — The employee, on several occasions, refused to attempt to perform work offered him by the insurer, and it was held, on the evidence, in *Asdoorian v. Massachusetts Employees Insurance Association*,¹ that his refusal to accept such employment was unreasonable.

Incapacity for Work due to Unreasonableness of Employee in refusing to permit of Performance of Operation. — The employee, in *Nicotero v. Globe Indemnity Company*,¹ refused to permit the performance of an operation for the removal of the affected eye, and it was held that such refusal was unreasonable, and that all incapacity for work was due to his unreasonableness and not to the injury.

One-eyed Employee loses Vision in Other Eye. — The employee, in *Morrison v. Fidelity and Casualty Company of New York*, received a personal injury which destroyed the vision in his left eye, the vision in right eye having been destroyed previously by reason of a cataract. Held, that he was totally incapacitated for work because of the injury.

Employee having no Useful Vision in Injured Eye not entitled to Additional Compensation. — The employee, in *Eldredge v. Employers' Liability Assurance Corporation, Ltd.*, did not have useful vision in the injured eye at the time of the occurrence of the injury. The accident destroyed any possibility of restoring sight to this eye. Held, that no additional compensation was due on account of the specific injury received.

Employee receives Personal Injury by Reason of Assault by Irate Customer. — The employee, in the case of *O'Connor v. London Guarantee and Accident Company, Ltd.*, had been instructed not to deliver merchandise to a certain customer because of his delinquency in paying his debts. This customer, having paid his bill, received the goods which he had ordered

¹ Appealed to Supreme Judicial Court.

and had occasion to pass the employee. The customer called the employee a name and struck at him as he passed. The employee parried the blow, and the customer laid hands on him, the former resisting, with the result that he received a personal injury which caused him to be totally incapacitated for work. Held, that the injury arose out of and in the course of his employment, on the ground that the risk of assault by an irate customer, to whom credit had been refused, was a peril involved in his contract of service.

Fatal Injury arises out of Quarrel precipitated by Deceased Employee. — It was held in the case of *Malloy v. Fidelity and Casualty Company of New York* that a fatal personal injury, arising out of a quarrel which was precipitated by the deceased employee, was not covered by the statute.

Dependent Daughter physically incapacitated for Earning. — The claimant, the daughter of the deceased employee, in the case of *Carter v. Travelers Insurance Company*,¹ lived with her mother, who was separated from her father, and all her support came from her father. She was in poor health and was physically incapacitated for earning. Held, that she was totally dependent upon the employee for support.

Father totally Dependent despite Fact that he assisted in conducting Unprofitable Business. — The employee contributed all of his earnings to his mother, who was the custodian of said earnings for the benefit of the family. The father, an invalid, assisted in conducting an unprofitable store, and it was held, in *De Pasquale v. Employers' Liability Assurance Corporation, Ltd.*, that he was wholly dependent upon the earnings of the deceased employee for support.

Partial Dependent receives Entire Earnings of Employee. — It was held, in *Devaney v. American Mutual Liability Insurance Company*, that the partial dependent who received all the earnings of the employee was entitled to full compensation.

Traveling Salesman receives Injury while on Way Home. — A traveling salesman intended to meet a customer at a certain place, but while en route changed his mind and decided to go home. He received an injury while on the way home, after

¹ Appended to Supreme Judicial Court.

having passed the point at which he expected to meet his customer. Held, in *Muir v. Ocean Accident and Guarantee Corporation, Ltd.*, that he was not entitled to compensation.

Inference of Fact drawn by Committee. — The evidence shows that it was the custom of the employee to warn the stablemen of the arrival of each team by ringing a bell, and it was often his habit to look out of the window to notice whether the team had been admitted. The body of the employee was found underneath the window from which the employee looked to note the arrival and admission of the teams, and it was held by the committee of arbitration, in the case of *O'Brien v. Casualty Company of America*, that the injury arose out of and in the course of the employment.

Evidence leaves Cause of Death of Employee in Doubt. — The evidence, in the case of *Murphy v. Employers' Liability Assurance Corporation, Ltd.*,¹ left the matter of the cause of death in doubt, and the Board held that the widow of the employee was not entitled to compensation.

Board has Authority to review and cancel Agreement in Regard to Compensation. — In the case of *Gertz v. Royal Indemnity Company* the Board ruled that it had authority to review an agreement previously approved, and cancelled same in view of the evidence, which showed that it was based on the erroneous assumption that the employee's loss of vision was due to a personal injury arising out of and in the course of the employment.

Signing of Settlement Receipt does not bar Proceedings by Employee to determine Right to Reimbursement on Account of Expenditure for Medical Services. — The insurer objected to the taking of jurisdiction by a committee of arbitration in the case of *Duey v. American Mutual Liability Insurance Company*, claiming that the signing of a settlement receipt by him acted as a bar to proceedings to determine his right to obtain payment of the amount expended for medical services under the statute. The committee ruled that it had jurisdiction, and awarded the employee the sum of \$18 to cover his expenditure for medical services under the statute.

¹ Appealed to Supreme Judicial Court.

Insurer questions Right to reopen Case after Approval of Settlement Receipt. — It was held, in *Jones v. Fidelity and Deposit Company of Maryland*,¹ that the right of an employee to further compensation was not barred by the signing of a settlement receipt, if there was evidence of a recurrence of incapacity for work by reason of the injury.

Deputy Surveyor of Lumber is a Public Official and not an Employee. — A committee of arbitration held, in *Emerson v. Massachusetts Employees Insurance Association*, that a deputy surveyor of lumber, appointed by the surveyor-general, whose duties were fixed by statute and whose salary was fixed by law, was not an "employee" under the Workmen's Compensation Act.

The survey of decisions printed in the foregoing pages is intended to indicate the attitude of the Board and of the Supreme Court in passing upon cases which arise under the Massachusetts act. In continuation of the policy begun after the completion of the first year of the act these rulings are available in greater detail in the second volume of cases and in the bulletins issued on Supreme Court decisions.

¹ Appealed to Supreme Judicial Court.

A SURVEY OF WORKMEN'S COMPENSATION LEGISLATION.

A survey of the progress of workmen's compensation laws in the different States of the Union, and a comparison of some of their leading features, is especially interesting and instructive. This class of legislation is comparatively new in this country, but so strongly has its justice and practicability appealed to the public that laws providing some form of compensation for injuries to workmen have been adopted in 24 States, all with one exception, that of Maryland, since the year 1910. Maryland passed laws on this subject in 1902, supplemented by acts in 1910 and 1912, but they were of limited scope both as to employees covered and the compensation provided. These acts have been repealed by the act in 1914 which takes effect Nov. 1, 1914. The States having workmen's compensation laws now in effect or about to become effective are as follows:—

Arizona, first in effect in 1912; recodified in 1913.

California, effective Sept. 1, 1911; superseded by act of 1913, effective Jan. 1, 1914.

Connecticut, effective Jan. 1, 1914.

Illinois, first act effective May 1, 1912; superseded by act effective July 1, 1913.

Iowa, effective in 1913.

Kansas, in effect Jan. 1, 1912; as amended and enlarged, effective May 12, 1913.

Louisiana, effective Jan. 1, 1915.

Maryland, effective Nov. 1, 1914.

Massachusetts, effective July 1, 1912; effective as amended Oct. 1, 1914.

Michigan, effective Sept. 1, 1912; effective as amended Aug. 13, 1913.

Minnesota, effective Oct. 1, 1913.

Nebraska, effective July 17, 1913.

Nevada, effective in 1911; amended and supplemented to take effect July 1, 1913.

New Jersey, effective July 4, 1911; effective as amended April, 1914.

New Hampshire, effective in 1911.

New York, effective July 1, 1914.

Ohio, effective Jan. 1, 1912; effective as amended May, 1914.

Oregon, effective July 1, 1913.

Rhode Island, effective Oct. 1, 1912, and as amended April 30, 1913.

Texas, effective Sept. 1, 1913.

Washington, effective Oct. 1, 1911, as amended June 11, 1913.

Wisconsin, effective in 1911, and as amended Sept. 1, 1913.

West Virginia, effective Oct. 1, 1913.

The system of compensation is elective in most of the States for both employer and employee, with supervision by a commissioner or board of commissioners under different titles with insurance in stock and mutual companies. In California, New York, Maryland, Ohio and Washington compensation is compulsory, and in Arizona it is compulsory as to employers, but elective after injury as to employees.

Employers failing to adopt the provisions of the act are deprived of their common-law defences of negligence of employee, assumption of the risk, and contributory negligence of fellow employees in Massachusetts, Connecticut, Kansas, Minnesota, New Jersey, Oregon, Rhode Island and West Virginia. In Illinois this rule applies to employers of the first class only, *i.e.*, those engaged in special hazardous employments, but employees in other occupations lose none of their defences by failure to elect compensation. In Louisiana the employer failing to elect compensation loses the three defences, and his negligence is presumed. In Michigan an employer failing to elect compensation loses the defences of fellow servant, assumption of the risk, and negligence of employee unless willful. In Nebraska and Nevada the rule is the same, modified only by an exception in case of the intoxication of the employee. In Texas the same rule prevails, except that the damages recovered are reduced in proportion to the extent of the employee's contributory negligence.

There is a wide variance in the amount of medical and surgical aid provided in the acts of different States. In Massachusetts it is provided during the first two weeks of disability, or longer in unusual cases, in the discretion of the Industrial Accident Board. In Rhode Island the term is two weeks. In New Jersey it is two weeks, with a maximum allowance of \$50; in Iowa and Louisiana, two weeks with a maximum of \$100; in Texas, one week; in Michigan, three weeks; in New

York, sixty days; in Connecticut, thirty days; in Ohio and West Virginia the period is in the discretion of the commission, with the maximum of \$150 in West Virginia and \$200 in Ohio. In Minnesota the period is ninety days, with the maximum of \$100, and if necessary the court may require payment after ninety days, with the total maximum of \$200. In Maryland an allowance is made not to exceed \$150. In Nebraska it is twenty-one days, with the maximum of \$200; in Illinois, eight weeks, with the maximum of \$200; in California and Wisconsin medical service is provided for ninety days. In Nevada no medical or surgical aid is provided except in case of death, when the burial expenses not exceeding \$125 are paid, and if employee leaves no dependents the expense of his last sickness and burial to an amount not exceeding \$125. In Arizona no medical or surgical aid is provided except in case of death, when medical and burial expenses are paid out of a lump sum compensation for dependents. In Kansas, Oregon and Washington there is no medical or surgical aid, and in New Hampshire only in case of death where there are no dependents, then medical and funeral expenses are payable to an amount not exceeding \$100.

Compensation is based in most of the States wholly on a percentage of the average weekly wages of the injured employee for a year preceding the injury. There are exceptions in some States where a lump sum is paid in certain cases. The period during which compensation is payable varies in different States. The rate of compensation in cases where it is computed on a percentage basis is 50 per cent. of the average weekly wages in the following States; namely, Arizona, Connecticut, New Hampshire, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Nebraska, Nevada, New Jersey, Oregon, Rhode Island and West Virginia; it is 60 per cent. of the average weekly wages in Texas; 65 per cent. in California and Wisconsin; and 66⅔ per cent. in Massachusetts, New York and Ohio. In Washington dependent widows are compensated by a flat monthly payment for life or until remarriage, and additional payment for each child under sixteen years of age.

There is great lack of uniformity in the period during which compensation is payable in the different States. In case of death, compensation is payable to widows and dependent widowers during life or until remarriage, in Washington and West Virginia; in New York, during widowhood or dependency, to widows or dependent widowers; in Oregon, during life or until remarriage, to widows and invalid widowers; in Louisiana the payment is from 25 to 50 per cent. of the average weekly wages, dependent upon the number and kinship of dependents; in California and Kansas it is three times the average yearly wages, with a maximum and minimum in Kansas; in Illinois it is four times the average yearly wages, with a maximum and minimum; in Arizona it is a sum equal to 2,400 times of one-half the average daily wages, with a maximum of \$4,000; in the remaining States it is a percentage of the average weekly wages for periods lasting from fifteen years in Wisconsin, and 500 weeks in Massachusetts, to 300 weeks in Michigan, Minnesota, New Jersey and Rhode Island; in New Hampshire it is 150 times the average weekly wages.

In case of total disability, compensation is payable during disability in Arizona, Maryland, Oregon and Washington, with the maximum of \$4,000 in Arizona and \$5,000 in Maryland. In New York and West Virginia compensation for total disability is during life; in California 240 weeks, at 65 per cent. of the average weekly wages, and thereafter for the remainder of the life at the rate of 40 per cent. of the average weekly wages. In Illinois and Wisconsin compensation is four times the annual wages, with the maximum of \$3,500, and in Illinois thereafter a life pension equal to 8 per cent. of the latter amount, but not less than \$10 per month. In the other States compensation in case of total disability is for a period varying from 520 weeks in Connecticut and 500 weeks in Michigan and Massachusetts to 300 weeks in Nebraska and New Hampshire.

Compensation for permanent partial disability is payable in California at the rate of four weeks for each 1 per cent. of disability. If the disability is 70 per cent. or more, payments are made for 240 weeks at the rate of 65 per cent. of wages;

and thereafter there is paid a life pension at the rate of 1 per cent. of wages for each 1 per cent. of disability in excess of 60 per cent. So that for a disability of 70 per cent., the pension after the expiration of 240 weeks is 10 per cent. of wages payable each week.

Compensation for partial disability is payable for life in California if permanent, for 240 weeks if temporary. In Maryland, Ohio, New York and Wisconsin compensation for partial disability is during disability without limit. In Washington compensation is payable in a lump sum, to be determined in accordance with the circumstances of each case. In Arizona the payment is the same as for total disability. In the other States the term varies from 500 weeks in Massachusetts to 300 weeks in Louisiana, Michigan, Minnesota, Nebraska, New Jersey, Rhode Island and Texas.

Several amendments were made to the Massachusetts compensation act by the legislation of 1914, which have greatly enlarged the benefits and facilitated the administration of the act. The rates of compensation in all cases have increased from 50 to 66 $\frac{2}{3}$ per cent. of the average weekly wage. Term of payment has been increased in cases of dependency and partial disability from 300 to 500 weeks. Casual employment has been covered by the act, and widows deserted by their husbands are now protected in their rights to compensation. The period of medical and surgical aid has in special cases been extended beyond two weeks, and increased authority for review of payments has been given to the Board.

THE THEORY OF LUMP SUM SETTLEMENTS.

In considering the question of lump sum settlements the Industrial Accident Board has in mind the well-understood principle that, except in extraordinary cases, compensation should be paid regularly and at weekly intervals. Authority for the redemption of liability by lump sum is given the Board by Part II., section 22 of the act, which reads as follows:—

Whenever any weekly payment has been continued for not less than six months, the liability therefor may in unusual cases where the parties agree and the board deems it to be for the best interest of the employee or his dependents, be redeemed by the payment, in whole or in part, by the association, of a lump sum which shall be fixed by the board, but in no case to exceed the amount provided by said act. The board may, however, in its discretion at any time in the case of a minor who has received permanently disabling injuries, either partial or total, provide that he be compensated, in whole or in part, by the payment of a lump sum, the amount of which shall be fixed by the board, but in no case to exceed the amount provided by said act.

Great care is exercised by the Board in coming to a decision as to whether requests for lump sum payments should be approved. A complete statement of all pertinent information is procured through the agency of personal conferences between members and the parties concerned, investigation of the unusual circumstances by inspectors, and impartial examinations if these are deemed necessary. The object of the provision with reference to the payment of lump sums to minors is largely to enable the Board to take such steps as will procure justice for minors injured at a period when their earning ability has not had sufficient time in which to develop. Money obtained for minors under this section is intended to be used in preparing them for a future life of usefulness.

When the Board has to pass upon an agreement, the law is interpreted to mean that the following conditions must be found before the settlement may be approved:—

1. The case must be unusual.

2. The settlement must be for the best interest of the employee or his dependent.

3. The amount fixed must be adequate.

What is an unusual case? The answer to this question cannot be stated so as to include all cases. As a starting point, however, the fact should be borne in mind that the compensation law is based on the principle of rehabilitation of injured employees, and of relief from financial stress during this period. In fatal cases the compensation is intended to enable dependents to adjust themselves to new conditions.

Cases in which these results may be attained by means of proper medical attention, and the payment of compensation weekly, are not unusual. Some cases of permanent disability and of dependency may be unusual by reason of the inadequacy of the compensation scale as applied to the individual case. This may be due to the amount received each week, or may be due to the future conditions likely to prevail at the expiration of the compensation term. Also, cases in which persons of foreign birth will be better able to get along at home, among friends and relatives, may be unusual. In actual practice the Board decides on the unusual features of each case presented, only after a careful investigation of circumstances.

If a case is considered to be unusual the next point to decide is whether or not a settlement will be for the best interest of the employee or his dependents. In other words, the Board must have full knowledge of the use to which the lump sum is to be put, and must be assured that the danger of loss or of waste is extremely remote. This point, also, can be decided only after a very careful investigation.

The third point to decide is that which relates to the adequacy of the settlement. Under the law, the Board has the right to fix the amount which will be approved, providing the parties agree, and providing the Board deems the case to be a proper one for settlement.

The question of adequacy requires considerable study if injured employees are to receive their full rights under the law. In fatal cases this question is simplified by a rule that the Board will not approve a settlement for any amount less than the pres-

ent value, at $4\frac{1}{2}$ per cent. interest, of future weekly payments. The insurance companies have accepted this rule as a basis to be used in computing settlements.

The difficulty in passing upon adequacy is found in cases of probable permanent disability. In solving this problem, two principal questions arise in every case: first, to what extent has the reparative process developed, and what is the probable anatomical and functional result; second, based on the answer to the first point, to what extent will there be an impairment in earning ability, either at the regular occupation or at a different occupation.

In determining these two questions, allowance must be made, also, for the possible difficulty which the employee, by reason of his injury, would have in procuring suitable work.

Medical opinion, the experience of the individual case, when work has been sought or performed, and experience derived from general sources are aids to be used in passing upon the legal aspects of a settlement.

In all cases the process of reasoning should be applied first to determine the degree of the impairment in earning capacity. When this decision is made, the next logical step is to apply the provisions of the compensation scale to this result. While at times there are obstacles in the way of following this method of analysis, the process, at least, has the merit of being an attempt at rational thinking.

In the majority of cases better results will be attained by this method than by one in which the figure is reached on a give-and-take basis. Under a compensation system awards should be determined by a uniform process of objective reasoning, and should not depend on the extent to which the trading instinct is developed in the parties to a case.

The foregoing discussion is intended to indicate the general method which the Board considers essential to the proper ultimate solution of the problem of fixing the amount in lump sum settlements. To standardize these principles in schedule form is a matter upon which no final action has as yet been taken. Any schedule constructed or used obviously must be subject to modification in a certain number of cases in order to obtain justice.

The difficulty in constructing a schedule which will meet all requirements is shown by the variations which occur in different State laws, and in foreign countries, on the matter of specific injuries. These schedules fail in most cases to give any weight to the varying effects of injuries to persons engaged in different kinds of occupations. Much of the data given below are valuable mainly to show the comparative scales of benefits in force. Yet, despite the limitations indicated above, for research purposes, there is existent a great deal of value in this material.

In Bulletin No. 126, issued by the United States Bureau of Labor Statistics, there is printed an interesting survey of the degrees of disability assigned to specified injuries in foreign countries and in this country.

The figures shown for this country are determined by finding the relation between the number of weeks allowed for permanent disability, taken as a base, and the number of weeks allowed for the several types of specified injuries indicated.

In States where compensation for specified injuries is in lieu of all other compensation, the results as printed at least show what is practically the percentage of disability recognized by the law. In those States, however, in which compensation for specified injuries is payable, in addition to all other compensation, the figures printed do not show the percentage of disability covered by the scale of benefits. For instance, in Massachusetts the loss of an arm entitles the injured person to 50 weeks' additional compensation. This number of weeks is 10 per cent. of 500 weeks; but to say that in Massachusetts the loss of an arm is a 10 per cent. disability gives no weight at all to the disability determined by the test of experience, and for which compensation is provided.

Some of the results given in the survey mentioned above are here printed as a matter of interest in connection with the problem under discussion. The following table gives the computed percentages of disability in specified injuries, effective in Connecticut, Iowa, Michigan, Minnesota, Nevada, New Jersey and Wisconsin.

Computed Percentages of Disability for Specified Injuries, based on Schedules of Compensation Awards under the Laws of Various States.

NATURE OF INJURY.	Connecticut.	Iowa.	Michigan.	Minnesota.	Nevada.	New Jersey.	Wisconsin.
Loss of —							
Arm,	40	50	40	50	50	50	50
Hand,	30	38	30	38	40	38	33
Thumb,	7	10	12	15	15	15	8
One phalange,	4	5	6	8	—	8	4
Index finger,	7	8	7	9	9	9	4
One phalange,	—	4	4	4	—	4	2
Middle finger,	6	6	6	8	7	8	3
One phalange,	—	3	3	4	—	4	1
Ring finger,	5	5	4	5	5	5	2
One phalange,	—	3	2	3	—	3	1
Little finger,	4	4	3	4	4	4	2
One phalange,	—	2	2	2	—	2	1
Leg,	35	44	35	44	45	44	33
Foot,	25	31	25	31	35	31	25
Great toe,	7	6	6	8	7	8	4
One phalange,	—	3	3	4	3	4	2
Other toe,	3	4	2	3	3	3	1
One phalange,	—	2	1	1	1	1	1
Sight of one eye,	20	25	20	25	25	25	25
Hearing, one ear,	10	—	—	—	—	—	8
Hearing, both ears,	30	—	—	—	—	—	33

The figures given above show a range for the loss of an arm between 40 and 50 per cent.; from 30 to 40 per cent. for the loss of a hand; from 7 to 15 per cent. for the loss of a thumb; and disabilities which vary from 1 to 9 per cent. for the loss of a phalange of a finger up to the entire finger. The percentage of disability allowed for the loss of a leg ranges from 33 to 44 per cent. of the maximum time allowed for permanent disability; for the loss of a foot, from 25 to 31 per cent.; for the loss of vision in one eye, from 20 to 25 per cent.;

for the loss of hearing in one ear, from 8 to 10 per cent.; and for hearing in both ears, 30 to 33 per cent.

In addition to the scales in force in the United States the survey previously mentioned includes, also, important data collected from German, French, Austrian, Russian and Italian sources. The experience of these countries in the administration of workmen's compensation laws is of great value. The information given in the following tables is taken from the French work, "Accidents du Travail: Guide pour l'Evaluation des Incapacités," by Imbert, Oddo and Chavernac; from Dr. Maximilian Miller's standard work on the subject of degrees of disability, entitled, "Die Erwerbsunfähigkeit und ihre Ursachen;" from a table of German adjudications by Könen-Köln; from a schedule prepared by Bähr, embodying the results of the experience of important German, Swiss and Austrian insurance associations; and from a scheme of percentage values prepared by Dr. C. Thiem in a work entitled, "Handbuch der Unfallerkrankungen."

The results of this collection of data are shown in the tables which follow:—

TABLE NO. 1. — *Degrees of Disability for Specified Injuries, according to Various Foreign Standards and Authorities, expressed in Percentages of Total Disability.*

NATURE OF INJURY.	Imbert.	Miller.	Könen-Köln.	Bähr.	Thiem.
Loss of right or major —					
Arm,	75	80-80	75	50-66⅔	66⅔-80
Forearm,	70	60-70	—	50-66⅔	—
Disarticulation at shoulder,	85	—	—	—	—
Hand,	65	60-70	66⅔	50-66⅔	60-66⅔
Thumb,	30	20-30	25-30	18-27	25-30
Including metacarpal bone,	35	30-40	—	—	30-33⅓
One phalange only,	15	—	—	—	—
Index finger,	15	15-15	15-20	12-17½	15-18
Two phalanges,	10	—	—	—	—
One phalange only,	6	—	—	—	—
Middle finger,	10	10-10	15	5-10	12
Two phalanges,	8	—	—	—	—
One phalange only,	5	—	—	—	—

TABLE NO. 1. — *Degrees of Disability for Specified Injuries, according to Various Foreign Standards and Authorities, expressed in Percentages of Total Disability* — Continued.

NATURE OF INJURY.	Imbert.	Miller.	Könen-Köln.	Bähr.	Thiem.
Loss or right or major — <i>Con.</i>					
Ring finger,	10	10-10	10	5-10	10
Two phalanges,	8	—	—	—	—
One phalange only,	5	—	—	—	—
Little finger,	8	10-10	10	10-17½	12
Two phalanges,	6	—	—	—	—
One phalange only,	3	—	—	—	—
Thumb and index finger,	45	—	—	—	—
Index and middle fingers,	25	—	—	—	—
Middle and ring fingers,	20	—	—	—	—
Ring and little fingers,	20	—	—	—	—
Thumb, index and middle fingers,	55	—	—	—	—
Index, middle and ring fingers,	35	—	—	—	—
Middle, ring and little fingers,	30	—	—	—	—
Thumb and 3 fingers,	65	—	—	—	—
Four fingers,	50	—	50	—	—
Loss of left or minor —					
Arm,	65	50-70	66⅔	40-50	60-70
Forearm,	60	50-60	—	40-50	—
Disarticulation at shoulder,	75	—	—	—	—
Hand,	55	20-30	50-60	12-17½	20-25
Thumb,	25	20-20	20-25	12-17½	20-25
Including metacarpal bone,	30	20-30	—	—	25-30
One phalange only,	10	—	—	—	—
Index finger,	10	15-15	15	8-12	12-15
Two phalanges,	8	—	—	—	—
One phalange only,	5	—	—	—	—
Middle finger,	8	10-10	10	5-10	10
Two phalanges,	6	—	—	—	—
One phalange only,	2	—	—	—	—
Ring finger,	8	10-10	10	5-10	10
Two phalanges,	6	—	—	—	—
One phalange only,	2	—	—	—	—
Little finger,	6	10-10	10	7½-10	10-12
Two phalanges,	4	—	—	—	—
One phalange only,	1	—	—	—	—

TABLE NO. 1. — *Degrees of Disability for Specified Injuries, according to Various Foreign Standards and Authorities, expressed in Percentages of Total Disability — Concluded.*

NATURE OF INJURY.	Imbert.	Miller.	Könen-Köln.	Bähr.	Thiem.
Loss of left or minor — <i>Con.</i>					
Thumb and index finger,	35	—	—	—	—
Index and middle fingers,	20	—	—	—	—
Middle and ring fingers,	15	—	—	—	—
Ring and little fingers,	12	—	—	—	—
Thumb, index and middle fingers, .	45	—	—	—	—
Index, middle and ring fingers, . .	25	—	—	—	—
Middle, ring and little fingers, . .	20	—	—	—	—
Thumb and 3 fingers,	50	—	—	—	—
Four fingers,	40	—	40	—	—
Loss of thigh —					
Disarticulation,	85-90	—	85	—	—
Amputation,	70-80	70-80	75	40-50	75
Loss of leg,	60-65	60-60	60	40-50	50-66 $\frac{2}{3}$
Loss of foot,	45-55	50-50	40	30-50	50
Fore part of foot only,	20-30	30-40	—	—	—
Loss of great toe,	12-16	10-10	10	5-10	0-10
Including metatarsal bone,	15-20	—	—	—	—
One phalange only,	4-5	—	—	—	—
Loss of other toe,	3-5	—	5	3-5	—
Loss of all toes,	20-25	—	—	—	20-33 $\frac{1}{3}$
Loss of sight, one eye,	20-50	25-33	—	25-40	20-30
Loss of hearing, one ear,					
Partial,	8-10	10-10	—	—	0-10
Complete,	10-15	20-20	—	25	20
Loss of hearing, both ears,					
Partial,	10-15	20-20	—	—	10-40
Complete,	50	50-50	—	65	50-60

TABLE NO. 2. — *Degrees of Disability for Specified Injuries, according to Various Foreign Standards and Authorities, expressed in Percentages of Total Disability.*

NATURE OF INJURY.	German Adjudications.	French Adjudications.	Austrian Imperial Office Ratings.	Italian Law.	Bavarian Wood-workers' Association.	Russian Standard, 1904.
Loss of right or major —						
Arm,	60-75	60-85	66-83	80	70-80	75
Forearm,	66-75	70-80	—	70-80	—	75
Disarticulation at shoulder,	—	—	—	—	—	75
Hand,	50-75	55-80	50-83	-70	70-80	75
Thumb,	-30	14-60	25-33	-30	22-26	30
Including metacarpal bone,	—	—	—	—	—	30
One phalange only,	10-20	6-30	-16	-15	11-13	15
Index finger,	10-15	8-15	—	-20	16-18	25
Two phalanges,	-10	7-20	—	—	—	15
One phalange only,	-10	2-12	-10	—	5½-6	—
Middle finger,	-20	6-16	—	-8	13-14	10
Two phalanges,	0-10	5-10	—	—	—	5
One phalange only,	0-10	3-10	1-10	-5	4-5	—
Ring finger,	15	8-11	—	8	8-10	-10
Two phalanges,	0-10	5-10	—	—	—	-5
One phalange only,	0-10	0-8	—	5	-3	—
Little finger,	-10	6-8	—	12	11-12	—
Two phalanges,	0-10	3-8	—	—	—	—
One phalange only,	0	0-6	8-10	5	-3½	-4
Thumb and index finger,	-40	—	—	—	—	-50
Index and middle fingers,	25-50	34-70	—	—	—	-35
Middle and ring fingers,	33-40	33-40	—	—	—	-25
Ring and little fingers,	20-33	10-20	—	—	—	-20
Thumb, index and middle fingers,	50-60	30-50	—	—	—	-60
Index, middle and ring fingers,	45-60	40-50	—	—	—	-50
Middle, ring and little fingers,	-33	50-60	—	—	—	-35
Thumb and 3 fingers,	50-60	60-65	—	—	—	-70
Four fingers,	—	-60	—	—	—	-70
Loss of left or minor —						
Arm,	-60	60-80	66-83	-75	60-70	-60
Forearm,	60-75	-60	66-75	65-75	—	-65

TABLE NO. 2. — *Degrees of Disability for Specified Injuries, according to Various Foreign Standards and Authorities, expressed in Percentages of Total Disability* — Continued.

NATURE OF INJURY.	German Adjudi- cations.	French Adjuda- cations.	Austrian Imperial Office Ratings.	Italian Law.	Wood- workers' Asso- ciation.	Russian Standard, 1904.
Loss of left or minor — <i>Con.</i>						
Disarticulation at shoulder, . . .	-	-	-	-	-	-60
Hand,	50-60	50-55	50-83	-65	60-70	-65
Thumb,	-25	10-20	25-30	-25	19-22	-25
Including metacarpal bone, . . .	-	-	-	-	-	-25
One phalange only,	10	5-13	-	-12	9½-11	-10
Index finger,	10	11-13	-	-15	14-16	-15
Two phalanges,	10	6-20	-	-	-	-10
One phalange only,	0-10	0-10	-	-	4½-5½	-
Middle finger,	-15	5-16	-	-8	11-13	-5
Two phalanges,	0-10	8-15	-	-	-	-
One phalange only,	0-10	3-10	1-10	-	3½-4	-
Ring finger,	0-10	8-10	-	-	7-8	-5
Two phalanges,	0-10	5-8	-	-	-	-
One phalange only,	0-10	2-6	-	-	2½-3	-
Little finger,	0-10	3-10	-	-	9-11	-
Two phalanges,	0-10	2-10	-	-	-	-
One phalange only,	-0	1-6	8-10	-	3-3½	-
Thumb and index finger,	-	-	-	-	-	-40
Index and middle fingers,	-	20-35	-	-	-	-25
Middle and ring fingers,	-	-	-	-	-	-20
Ring and little fingers,	-	-13	-	-	0	-10
Thumb, index and middle fingers,	-33	30-40	-	-	0	-50
Index, middle and ring fingers,	-45	-	-	-	-	-40
Middle, ring and little fingers,	-	20-35	-	-	-	-20
Thumb and 3 fingers,	-	-	-	-	-	-60
Four fingers,	-	-	-	-	-	-55
Loss of thigh —						
Disarticulation,	-85	-	50-83	-70	-	-
Amputation,	-66	65-90	-66	-60	50-70	-75
Loss of leg,	50-70	43-65	45-65	-50	-	-65
Loss of foot,	50-60	60-65	-	-50	50-60	-60
Fore part of foot only,	35-50	-	-	-	-	-50

TABLE NO. 2. — *Degrees of Disability for Specified Injuries, according to Various Foreign Standards and Authorities, expressed in Percentages of Total Disability — Concluded.*

NATURE OF INJURY.	German Adjudications.	French Adjudications.	Austrian Imperial Office Ratings.	Italian Law.	Bavarian workers' Association.	Russian Standard, 1904.
Loss of great toe,	10-15	5-8	-10	-7	15-20	-10
Including metatarsal bone,	-	-	-	-15	-	-
One phalange only,	-	2-8	-	-	-	-
Loss of other toe,	-5	7-20	-	-5	5-6	-
Loss of all toes,	20-25	-	-30	-	50-60	-25
Loss of sight, one eye,	-25	-33	-	-35	35-50	-35
Loss of hearing, one ear,						
Partial,	10-40	-	-	-	-	-
Complete,	15-30	4-22	-	-10	-	-10
Loss of hearing, both ears,						
Partial,	20-30	-	-	-	-	-
Complete,	15-50	-	-45	-40	-	-50

The figures derived from foreign sources, as compared with fixed scales of benefits in this country, show a much finer distinction in classifying injuries, as well as a wider latitude in stating the percentage of disablement for any one type of injury. These figures disclose the fact, also, that according to European experience the percentage of disability is considerably higher than that allowed in those State laws which fix for specified injuries definite periods of time in which compensation is paid in lieu of all other compensation. The schedule used by the State of California, in rating permanent disabilities, considered in another chapter in this report, is the only example of a fixed schedule in which any serious attempt is made to classify in detail nature of the injury, and the effect according to occupation.

In conclusion, the purpose of this chapter has been to indicate the policy and procedure adopted by the Board in passing upon lump sum settlements for which provision is made under

section 22, Part II. of the act. Although the methods outlined are not crystallized in any schedule form, a definite and uniform method of reasoning applied to the facts of the individual case in general gives satisfactory results. To carry out these principles to the best advantage, the Board undoubtedly should be empowered in all cases of permanent disablement to enforce a lump sum settlement, in its discretion, and to fix the amount.

The survey of permanent disability experience has been presented in this chapter for the purpose of indicating sources of information which are valuable in connection with the problem of determining the adequacy of settlements. The figures given are not recommended as a basis for fixing the amount of a settlement; but, as a guide in comparing the results obtained by other processes, these data are worth consideration.

THE PAYMENT OF COMPENSATION BY LUMP SUM.

The Board is authorized under the law, "in unusual cases," to approve the payment of the compensation due in the future under said law by the payment of a lump sum, if the parties agree to redeem all liability by such payment. It was the intention of the Legislature to safeguard the interests of the employee or his dependents, first, by requiring the parties to agree; second, to require the Industrial Accident Board to pass upon such agreement; and third, to provide that all cases in which the liability was redeemed by the payment of a lump sum should be unusual.

A great variety of reasons are advanced by employees to secure the approval by the Board of such settlements, from a desire to purchase a piano for the dependent children to a plan for the permanent investment of the money probably due in a small business or real estate venture. Very often requests come in for a lump sum payment because the widow has exceeded her income and is in debt for necessities. Sometimes misfortune, such as sickness, afflicts the family from which the employee has been removed by reason of a fatal industrial injury, and at times an alien, who is entitled to a sum of \$1,000 or more, finds that he can provide more amply for his future by leaving for home, and comes to the Board for assistance in making a settlement.

Because a settlement by lump sum redeems all liability on the part of the insurer in the future, the Board exercises the greatest possible care and precaution in approving settlements. The widow who desired a lump sum for the purpose of purchasing a piano and other luxuries, so that her little ones might have all the advantages of their more fortunate neighbors, was not considered unusual, and the application was denied. So, too, was the application of the widow who wished to buy a piece of land with the money due her under the statute. Investigation in both cases proved that the family, with the income under the act taken away from them, would be without means to buy actual necessities of life. Yet the Board was

criticized by the applicants for its failure to approve their request.

A certain widow, whose husband was killed by a cave-in of a sand bank, asked and obtained without the Board's approval a lump sum of money, and when the agreement was filed with the Board, shortly after its unauthorized payment, an investigation showed that she wanted the money to buy new clothing for her married daughters, and had spent \$300 within ten days of its receipt from the insurer. The insurer was notified immediately that the Board disapproved the payment and was ordered to resume weekly payments. The insurer then called upon the widow to refund the amount paid, but was able only to secure the return of a part of the sum. Had this payment been approved by the Board, five minor children of the deceased employee eventually might have suffered in order to provide luxuries and unnecessary garments for married daughters.

On the other hand, a widow, who was a stenographer prior to the death of her husband, asked for the payment of the compensation due by lump sum for the purpose of clearing off the mortgage upon the three-family home in which she resided. Her husband was a skilled workman, and received more than \$15 per week; therefore she was entitled to the maximum weekly compensation due under the law. She showed the Board that she could obtain employment again as a stenographer at \$15 weekly, and that she would receive a net income of \$60 monthly from the property. Obviously, this was a proper case for an adjustment.

Then there was the case of a widow with five children, who received a weekly payment of \$8.62 under the statute, and who had a son aged seventeen earning \$7 weekly. She was not able to pay her living expenses on an income of \$15.62, stating that she was going more deeply into debt each week, and asked the Board to approve the payment of all the compensation due her by lump sum. She stated that she would put the money into a bank and draw upon it in emergencies, as needed. Care was taken to show her that, based on her own estimates of expenses above her income, she would deplete the fund within

two years and then have a net income of the boy's wages, possibly not more than \$7, and have four children under sixteen to support on that income. She was allowed a partial lump sum payment to free her of her burden of debt and advised to live within her income, which should have been ample with proper management, under the circumstances.

The widow who wanted to get a lump sum to furnish funds with which to build a summer bungalow, the woman who made a lump sum request every time she got behind in her rent, the dependent who desired to pay a thousand or more dollars for a house than it was worth at a fair market appraisal, are all well known at the office of the Board.

A particularly annoying case was that in which an alien with three children, the oldest not above five years, was approached by a real estate agent to purchase a worn-out boarding house, with the picture of prosperity as presented by the agent through the money netted from the board of prospective customers. Involved in this case was a prospective second husband, whom she desired to establish as the head of the boarding place. She had an attorney, also, who was engaged to look into the title and make all necessary arrangements for the transfer. Everything was in readiness for the transfer of title, except the approval of the Board, which was considered merely a matter of form, in view of the roseate picture of the advantage to be gained by the purchase and operation of the property. The widow had a large sum coming to her under the statute, nearly \$3,000; the price set upon the property was \$9,200; she was to pay the money due under the act as a deposit, and first and second mortgages would be given to take care of the interests of the owner. An investigation was made which showed that a fair appraisal of the property would make not more than \$5,700 a fair price, and all the parties were summoned to the Board for conference. They all came, — the real estate agent, his client and their attorney; the widow, her prospective husband and her attorney; and others interested in the consummation of the deal. Then the Board, through its chairman, gave them the story, brought the responsible ones to task, and gave the ruling of the Board, — a refusal to approve the adjust-

ment. Had the widow been allowed to purchase the property she would have owed more in money than the place was fairly worth, after having paid on the purchase price all the money which came to her as the result of her husband's death.

In contrast with the above case is the allowance of a lump sum made to another foreign-born widow with three children, who started a boarding house near a cotton mill in a textile center and instantly made a success of the venture. She, however, unlike her sister widow, got a bargain in the real estate market, had money to spare after purchasing the property, and, being a business woman, made money on her venture from its inception. The investigation made by the Board showed the probable success of this woman, whose previous history indicated her thrift. She had saved \$1,000 in five years from her husband's weekly wage of \$10.80, and cared for three children during the course of her married career.

While there are many cases in which the employee, in his desire to obtain a lump sum payment, agrees to take less than his future compensation properly should be redeemed for, there are many other cases in which the insurer, after the matter has been considered by the Board, accepts the suggestion that a larger payment be made in such cases as appear to be justified under the law.

We have many instances where employees express their annoyance at the refusal of the Board to approve lump sum adjustments for small amounts, or under circumstances which the Board regards as not being unusual, where time proves the wisdom of the refusal. The employee who to-day has only a slight lowering in earning capacity may to-morrow find himself, by reason of the injury, earning much less than before, or perhaps be totally incapacitated for work because of such injury. A settlement by lump sum for a small amount is, under such circumstances, unwise and is disapproved. Certain of these cases, having afterwards developed into serious disability, indicate that the policy of the Board in considering all the facts carefully is wise.

There are cases, such as that of the weaver at Fall River, who asked for and was granted by the insurer an agreement

to pay \$500 by lump sum, where the insurer afterwards doubled the sum when the investigation of a Board member indicated that it was a case where \$1,000 should be paid. The weaver started and is now maintaining a successful business. Then, we have a case in which the employee became totally blind, and where the insurer, without question, paid the full amount due under the act, without deduction. Properly, it might delay the lump sum adjustment in the possible event of death occurring from some cause other than the injury, or for other reasons asking for a rebate above the proper interest charge allowed by the Board.

Perhaps one of the most deserving cases which has been brought to the attention of the Board is that of an electric lineman who received such serious injuries from electric burns that he lost one eye and was required to have his left arm amputated. He was entitled to the maximum weekly payments during incapacity, and again the insurer waived all rights as to possible future earning capacity, or intervening cause, and paid the full sum. The employee was not allowed to take the money, however, until the Board had investigated the merits of his proposal to buy a farm. Such investigation indicated the wisdom of the payment, especially in view of the employee's ability to conduct a farm, and he has been in successful and profitable possession of it for nearly a year.

Finally, in all lump sum cases the Board desires solely to protect the interests of the maimed employee, or the fatherless children and bereft widows. No other consideration is of weight, and the greatest care is used in its endeavor to safeguard the sufferers from industrial injuries and fatalities arising therefrom from the dangers of ill-advised investments and the misspending of the compensation which makes it possible for them to be independent of almsgiving and charity seeking.

**TABLES USED BY THE INDUSTRIAL ACCIDENT BOARD FOR
THE DETERMINATION OF WEEKLY COMPENSATION,
LENGTH OF TERM AND PRESENT VALUE.**

INTRODUCTION.

Amendments to the Workmen's Compensation Act made effective Oct. 1, 1914, provide that weekly compensation shall equal two-thirds of the loss of average weekly wages instead of one-half of wages, provided under the previous law. The minimum of \$4 and the maximum of \$10, however, remain the same. For permanent total disability the term of benefits remains the same, viz., 500 weeks, but the aggregate of weekly payments is limited by \$4,000 instead of \$3,000. In fatal cases, and in cases of permanent partial disability, the term of benefits is increased from 300 to 500 weeks, and the limit of aggregate payments is increased from \$3,000 to \$4,000.

As a result of the changes outlined above there is an increased amount of work in determining the benefits due under the act. This statement holds true when applied to the simple process of figuring two-thirds instead of one-half of wages, and also in connection with the necessity for determining the term to run in those cases where weekly payments will reach the maximum of \$4,000.

To facilitate this work the Industrial Accident Board makes use of the tables presented in this chapter. These tables, together with a brief description, are published by the Board at this time both for the convenience of those who have an interest in cases which come under the act and for the purpose of having benefits determined on a uniform basis which may be understood as authoritative for all persons concerned.

The nature of these tables is indicated below in the order in which they are printed:—

Table I.—Amounts of weekly compensation at the rate of 66 $\frac{2}{3}$ per cent. of average weekly wages.

Table II.—Length of term for compensation payments in cases limited by the maximum of \$4,000.

Table III. — Present value, at $4\frac{1}{2}$ per cent., interest compounded annually, of the remainder of an original benefit of \$1 per week for 500 weeks.

EXPLANATION OF TABLES.

Table I. — *Amounts of Weekly Compensation at the Rate of $6\frac{2}{3}$ Per Cent. of Average Weekly Wages.*

This table gives results for wages between \$1 and \$15 per week. In cases of total disability, specified injuries, and of total dependency, the values will be found opposite the wage columns, between \$6 and \$15. These two wage limits control the statutory provision that, in such cases, compensation shall be not less than \$4 nor more than \$10 per week.

Example. — If average wages are \$11.50, find this amount in the column "Wages per Week," on page 162, and opposite this figure in the column to the right, "Weekly Compensation," is shown the amount of compensation, — \$7.67. In those cases where wages are less than \$6 per week the compensation will be \$4; and when weekly wages exceed \$15, weekly compensation will be \$10.

In cases of partial disability and of partial dependency in fatal cases there is no minimum limit of weekly compensation.

To determine the amount of weekly compensation in such cases the first step necessary is to ascertain —

(a) In cases of partial disability the difference between average weekly wages before the injury and the average weekly wages earned after the return to work.

(b) In cases of partial dependency in fatal cases, the average amount of weekly earnings which were contributed by the deceased to partial dependents, if the average weekly wages of the deceased are within the group limited by \$6 and \$15.¹

When the amount contributed is agreed upon the weekly compensation may be found by reference to the wage column, and

¹ In cases where the average wages fall below or above these limits it is necessary to apply to the minimum of \$1, or to the maximum of \$10, weekly compensation the proportion of average wages contributed by the deceased. Example: wages, \$18; contributed, \$12. The process is indicated as follows: $\frac{12}{18} \times \$10 = \6.67 .

by reading in the next column the amount of weekly compensation placed opposite.

Examples. — 1. Weekly wages before injury, \$13.80; after return to work, \$10. The difference is \$3.80. By turning to this amount under "Wages," on page 158, the corresponding weekly compensation is shown to be \$2.53.

2. Wages of deceased, \$9. Amount contributed to a partial dependent, \$5.50. On page 159, the amount of weekly compensation set opposite this figure is \$3.67.

For the purpose just cited compensation has been figured on wages down to \$1. There are comparatively few cases where the wage basis is less than this amount.

Table II. — Length of Term for Compensation Payments in Cases limited by the Maximum of \$4,000.

In long term cases the maximum possible time in which weekly compensation may continue is 500 weeks, but total payments are limited to \$4,000. This statement excludes additional compensation which need not be considered in this connection. When weekly compensation is \$8 or less the period may extend to 500 weeks. When weekly compensation is more than \$8 the period will be less than 500 weeks, because of the effect of the limit of \$4,000. In these cases, therefore, where the maximum of \$4,000 applies, the longest period is 500 weeks and the shortest period is 400 weeks, the latter being due to the effect of the \$10 weekly maximum.

The term to run in these cases is shown by 1-cent gradations for amounts of weekly compensation between \$8 and \$10. The length of the periods is expressed in terms of weeks and days. The small figure to the right of the decimal point in the column of days expresses the theoretical decimal part of the day, and is inserted to balance the total payment to \$4,000.

Example. — Suppose in a fatal case in which there is total dependency that the wages of the deceased were \$14 per week. By referring to this amount in Table I., the weekly compensation is found to be \$9.33. To obtain the length of time compensation will continue, find \$9.33 on page 165 of Table II., in the column of "Weekly Compensation," and opposite this figure is

the period sought, — 428 weeks, 5 days (and $\frac{7}{100}$ of a day, which brings total payments to practically \$4,000).

Please note that this table need be used only when compensation is some amount between \$8 and \$10 per week.

Table III. — Present Value, at 4½ Per Cent., Interest compounded annually, of the Remainder of an Original Benefit of \$1 per Week for 500 Weeks.

The table given under this heading is approved by the Board for determining the present value of a lump sum settlement in fatal cases, or in non-fatal cases when the amount of discount is desired on an agreed basis. This table gives discount values only, and does not give any weight to the element of mortality.

The values given are based on the present worth of \$1 per week for a term to run which ranges from 500 to 0 weeks. From the first column, knowing the number of weeks expired since the beginning of the benefit, may be found opposite, in the third column, the present value of \$1 per week for the balance of a period of 500 weeks. The future period to run is shown in the second column. This first column, however, should be used only in those cases in which, originally, the term to run was 500 weeks. This can be so only when weekly compensation is \$8 or less. In all other cases, when weekly compensation is more than \$8, there should be determined, first, the full term of the period of compensation; second, the number of weeks elapsed since the beginning of the benefit; and third, the remaining time to run, by subtracting the number of weeks elapsed from the entire length of the term.

Having determined the number of weeks to run, the present value of \$1 per week for this period will be found in the table opposite the proper number of weeks, as shown in the second column. In a good many cases, doubtless, it will be found that the period to run will not be an even number of weeks, and in such cases the value will have to be determined by interpolating between the value for the even number of weeks in the term to run and that for the next higher number of weeks, as given in the table.

Examples. — 1. Suppose weekly compensation is \$6 per week in a fatal case. After weekly payments have been continued for 30 weeks the lump sum value of future payments is desired in order to effect a settlement. On page 166 of Table III., in the column "Time since Beginning of Benefit," find 30 weeks, and opposite, in the column "Present Value of \$1 per Week for Remainder of Period," is set \$387.615; $\$6 \times \$387.615 = \$2,325.69$, which is the lump sum value of future payments.

2. Suppose compensation is \$10 per week, and payments have been made for 45 weeks. The process for determining the lump sum value in this case is indicated below.

The full period of weekly benefits equals 400 weeks; payments made equal 45 weeks; subtraction shows balance of term, 355 weeks. Opposite this figure, which will be found in the column "Remaining Time to Run," on page 166 of Table III., the present value of \$1 per week is given as \$306.509; $\$10 \times \$306.509 = \$3,065.09$, the value sought.

3. Suppose weekly compensation to be \$8.85; and that payments have been made for 32 weeks. From Table II. we find that compensation of \$8.85 per week will run from the beginning of the benefit for a period of 451 weeks, 6.84 days.

By subtracting from this length of time the time in which payments have been made, *i.e.*, 451 weeks, 6.84 days, less 32 weeks, we get 419 weeks, 6.84 days as the remaining time to run.

Table III. does not show values for fractional parts of a week, but these values may be easily obtained by interpolation. The process for arriving at the result desired in the foregoing example is shown below.

The present value of \$1 per week for 419 weeks, 6.84 days lies between the value for 419 weeks and that for 420 weeks.

Present value for 419 weeks equals	.	.	.	.	.	\$352.620
Present value for 420 weeks equals	.	.	.	.	.	353.321
The difference for 1 week equals	.	.	.	.	.	.701
The difference for 1 day equals	.	.	.	.	.	.100
The difference for 6.84 days equals	.	.	.	.	.	.684

From the above, for 419 weeks, we obtain a value of \$352.620, and for 6.84 days, a value of \$0.684. The sum of these values equals the present value of \$1 per week for 419 weeks, 6.84 days, or \$353.304; $\$353.304 \times \$8.85 = \$3,126.74$, the result desired.

In view of the fact that there is a necessary delay between the time when there is reached an agreement for redeeming a liability by lump sum and the time when the Board is able to investigate and approve the settlement, weekly compensation should be continued, and the amount of the settlement after approval should be reckoned at the time of payment.

The tables which have been considered in the preceding explanation are printed in the following pages:—

TABLE I. — *Amounts of Weekly Compensation at the Rate of 66 $\frac{2}{3}$ Per Cent. of Average Weekly Wages.**\$1 to \$1.99, inclusive.*

Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.
\$1 00	\$0 67	\$1 25	\$0 83	\$1 50	\$1 00	\$1 75	\$1 17
01	67	26	84	51	1 01	76	1 17
02	68	27	85	52	1 01	77	1 18
03	69	28	85	53	1 02	78	1 19
04	69	29	86	54	1 03	79	1 19
05	70	1 30	87	55	1 03	1 80	1 20
06	71	31	87	56	1 04	81	1 21
07	71	32	88	57	1 05	82	1 21
08	72	33	89	58	1 05	83	1 22
09	73	34	89	59	1 06	84	1 23
1 10	73	35	90	1 60	1 07	85	1 23
11	74	36	91	61	1 07	86	1 24
12	75	37	91	62	1 08	87	1 25
13	75	38	92	63	1 09	88	1 25
14	76	39	93	64	1 09	89	1 26
15	77	1 40	93	65	1 10	1 90	1 27
16	77	41	94	66	1 11	91	1 27
17	78	42	95	67	1 11	92	1 28
18	79	43	95	68	1 12	93	1 29
19	79	44	96	69	1 13	94	1 29
1 20	80	45	97	1 70	1 13	95	1 30
21	81	46	97	71	1 14	96	1 31
22	81	47	98	72	1 15	97	1 31
23	82	48	99	73	1 15	98	1 32
24	83	49	99	74	1 16	99	1 33

\$2 to \$2.99, inclusive.

\$2 00	\$1 33	\$2 25	\$1 50	\$2 50	\$1 67	\$2 75	\$1 83
01	1 34	26	1 51	51	1 67	76	1 84
02	1 35	27	1 51	52	1 68	77	1 85
03	1 35	28	1 52	53	1 69	78	1 85
04	1 36	29	1 53	54	1 69	79	1 86
05	1 37	2 30	1 53	55	1 70	2 80	1 87
06	1 37	31	1 54	56	1 71	81	1 87
07	1 38	32	1 55	57	1 71	82	1 88
08	1 39	33	1 55	58	1 72	83	1 89
09	1 39	34	1 56	59	1 73	84	1 89
2 10	1 40	35	1 57	2 60	1 73	85	1 90
11	1 41	36	1 57	61	1 74	86	1 91
12	1 41	37	1 58	62	1 75	87	1 91
13	1 42	38	1 59	63	1 75	88	1 92
14	1 43	39	1 59	64	1 76	89	1 93
15	1 43	2 40	1 60	65	1 77	2 90	1 93
16	1 44	41	1 61	66	1 77	91	1 94
17	1 45	42	1 61	67	1 78	92	1 95
18	1 45	43	1 62	68	1 79	93	1 95
19	1 46	44	1 63	69	1 79	94	1 96
2 20	1 47	45	1 63	2 70	1 80	95	1 97
21	1 47	46	1 64	71	1 81	96	1 97
22	1 48	47	1 65	72	1 81	97	1 98
23	1 49	48	1 65	73	1 82	98	1 99
24	1 49	49	1 66	74	1 83	99	1 99

TABLE I. — *Amounts of Weekly Compensation at the Rate of 66 $\frac{2}{3}$ Per Cent. of Average Weekly Wages — Continued.**\$3 to \$3.99, inclusive.*

Wages per Week.	Weekly Compen- sation.	Wages per Week.	Weekly Compen- sation.	Wages per Week.	Weekly Compen- sation.	Wages per Week.	Weekly Compen- sation.
\$3 00	\$2 00	\$3 25	\$2 17	\$3 50	\$2 33	\$3 75	\$2 50
01	2 01	26	2 17	51	2 34	76	2 51
02	2 01	27	2 18	52	2 35	77	2 51
03	2 02	28	2 19	53	2 35	78	2 52
04	2 03	29	2 19	54	2 36	79	2 53
05	2 03	3 30	2 20	55	2 37	3 80	2 53
06	2 04	31	2 21	56	2 37	81	2 54
07	2 05	32	2 21	57	2 38	82	2 55
08	2 05	33	2 22	58	2 39	83	2 55
09	2 06	34	2 23	59	2 39	84	2 56
3 10	2 07	35	2 23	3 60	2 40	85	2 57
11	2 07	36	2 24	61	2 41	86	2 57
12	2 08	37	2 25	62	2 41	87	2 58
13	2 09	38	2 25	63	2 42	88	2 59
14	2 09	39	2 26	64	2 43	89	2 59
15	2 10	3 40	2 27	65	2 43	3 90	2 60
16	2 11	41	2 27	66	2 44	91	2 61
17	2 11	42	2 28	67	2 45	92	2 61
18	2 12	43	2 29	68	2 45	93	2 62
19	2 13	44	2 29	69	2 46	94	2 63
3 20	2 13	45	2 30	3 70	2 47	95	2 63
21	2 14	46	2 31	71	2 47	96	2 64
22	2 15	47	2 31	72	2 48	97	2 65
23	2 15	48	2 32	73	2 49	98	2 65
24	2 16	49	2 33	74	2 49	99	2 66

\$4 to \$4.99, inclusive.

\$4 00	\$2 67	\$4 25	\$2 83	\$4 50	\$3 00	\$4 75	\$3 17
01	2 67	26	2 84	51	3 01	76	3 17
02	2 68	27	2 85	52	3 01	77	3 18
03	2 69	28	2 85	53	3 02	78	3 19
04	2 69	29	2 86	54	3 03	79	3 19
05	2 70	4 30	2 87	55	3 03	4 80	3 20
06	2 71	31	2 87	56	3 04	81	3 21
07	2 71	32	2 88	57	3 05	82	3 21
08	2 72	33	2 89	58	3 05	83	3 22
09	2 73	34	2 89	59	3 06	84	3 23
4 10	2 73	35	2 90	4 60	3 07	85	3 23
11	2 74	36	2 91	61	3 07	86	3 24
12	2 75	37	2 91	62	3 08	87	3 25
13	2 75	38	2 92	63	3 09	88	3 25
14	2 76	39	2 93	64	3 09	89	3 26
15	2 77	4 40	2 93	65	3 10	4 90	3 27
16	2 77	41	2 94	66	3 11	91	3 27
17	2 78	42	2 95	67	3 11	92	3 28
18	2 79	43	2 95	68	3 12	93	3 29
19	2 79	44	2 96	69	3 13	94	3 29
4 20	2 80	45	2 97	4 70	3 13	95	3 30
21	2 81	46	2 97	71	3 14	96	3 31
22	2 81	47	2 98	72	3 15	97	3 31
23	2 82	48	2 99	73	3 15	98	3 32
24	2 83	49	2 99	74	3 16	99	3 33

TABLE I. — *Amounts of Weekly Compensation at the Rate of 66 $\frac{2}{3}$ Per Cent. of Average Weekly Wages — Continued.**\$5 to \$5.99, inclusive.*

Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.
\$5 00	\$3 33	\$5 25	\$3 50	\$5 50	\$3 67	\$5 75	\$3 83
01	3 34	26	3 51	51	3 67	76	3 84
02	3 35	27	3 51	52	3 68	77	3 85
03	3 35	28	3 52	53	3 69	78	3 85
04	3 36	29	3 53	54	3 69	79	3 86
05	3 37	5 30	3 53	55	3 70	5 80	3 87
06	3 37	31	3 54	56	3 71	81	3 87
07	3 38	32	3 55	57	3 71	82	3 88
08	3 39	33	3 55	58	3 72	83	3 89
09	3 39	34	3 56	59	3 73	84	3 89
5 10	3 40	35	3 57	5 60	3 73	85	3 90
11	3 41	36	3 57	61	3 74	86	3 91
12	3 41	37	3 58	62	3 75	87	3 91
13	3 42	38	3 59	63	3 75	88	3 92
14	3 43	39	3 59	64	3 76	89	3 93
15	3 43	5 40	3 60	65	3 77	5 90	3 93
16	3 44	41	3 61	66	3 77	91	3 94
17	3 45	42	3 61	67	3 78	92	3 95
18	3 45	43	3 62	68	3 79	93	3 95
19	3 46	44	3 63	69	3 79	94	3 96
3 20	3 47	45	3 63	5 70	3 80	95	3 97
21	3 47	46	3 64	71	3 81	96	3 97
22	3 48	47	3 65	72	3 81	97	3 98
23	3 49	48	3 65	73	3 82	98	3 99
24	3 49	49	3 66	74	3 83	99	3 99

\$6 to \$6.99, inclusive.

\$6 00	\$4 00	\$6 25	\$4 17	\$6 50	\$4 33	\$6 75	\$4 50
01	4 01	26	4 17	51	4 34	76	4 51
02	4 01	27	4 18	52	4 35	77	4 51
03	4 02	28	4 19	53	4 35	78	4 52
04	4 03	29	4 19	54	4 36	79	4 53
05	4 03	6 30	4 20	55	4 37	6 80	4 53
06	4 04	31	4 21	56	4 37	81	4 54
07	4 05	32	4 21	57	4 38	82	4 55
08	4 05	33	4 22	58	4 39	83	4 55
09	4 06	34	4 23	59	4 39	84	4 56
6 10	4 07	35	4 23	6 60	4 40	85	4 57
11	4 07	36	4 24	61	4 41	86	4 57
12	4 08	37	4 25	62	4 41	87	4 58
13	4 09	38	4 25	63	4 42	88	4 59
14	4 09	39	4 26	64	4 43	89	4 59
15	4 10	6 40	4 27	65	4 43	6 90	4 60
16	4 11	41	4 27	66	4 44	91	4 61
17	4 11	42	4 28	67	4 45	92	4 61
18	4 12	43	4 29	68	4 45	93	4 62
19	4 13	44	4 29	69	4 46	94	4 63
6 20	4 13	45	4 30	6 70	4 47	95	4 63
21	4 14	46	4 31	71	4 47	96	4 64
22	4 15	47	4 31	72	4 48	97	4 65
23	4 15	48	4 32	73	4 49	98	4 65
24	4 16	49	4 33	74	4 49	99	4 66

TABLE I. — *Amounts of Weekly Compensation at the Rate of 66 $\frac{2}{3}$ Per Cent. of Average Weekly Wages — Continued.**\$7 to \$7.99, inclusive.*

Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.
\$7 00	\$4 67	\$7 25	\$4 83	\$7 50	\$5 00	\$7 75	\$5 17
01	4 67	26	4 84	51	5 01	76	5 17
02	4 68	27	4 85	52	5 01	77	5 18
03	4 69	28	4 85	53	5 02	78	5 19
04	4 69	29	4 86	54	5 03	79	5 19
05	4 70	7 30	4 87	55	5 03	7 80	5 20
06	4 71	31	4 87	56	5 04	81	5 21
07	4 71	32	4 88	57	5 05	82	5 21
08	4 72	33	4 89	58	5 05	83	5 22
09	4 73	34	4 89	59	5 06	84	5 23
7 10	4 73	35	4 90	7 60	5 07	85	5 23
11	4 74	36	4 91	61	5 07	86	5 24
12	4 75	37	4 91	62	5 08	87	5 25
13	4 75	38	4 92	63	5 09	88	5 25
14	4 76	39	4 93	64	5 09	89	5 26
15	4 77	7 40	4 93	65	5 10	7 90	5 27
16	4 77	41	4 94	66	5 11	91	5 27
17	4 78	42	4 95	67	5 11	92	5 28
18	4 79	43	4 95	68	5 12	93	5 29
19	4 79	44	4 96	69	5 13	94	5 29
7 20	4 80	45	4 97	7 70	5 13	95	5 30
21	4 81	46	4 97	71	5 14	96	5 31
22	4 81	47	4 98	72	5 15	97	5 31
23	4 82	48	4 99	73	5 15	98	5 32
24	4 83	49	4 99	74	5 16	99	5 33

\$8 to \$8.99, inclusive.

\$8 00	\$5 33	\$8 25	\$5 50	\$8 50	\$5 67	\$8 75	\$5 83
01	5 34	26	5 51	51	5 67	76	5 84
02	5 35	27	5 51	52	5 68	77	5 85
03	5 35	28	5 52	53	5 69	78	5 85
04	5 36	29	5 53	54	5 69	79	5 86
05	5 37	8 30	5 53	55	5 70	8 80	5 87
06	5 37	31	5 54	56	5 71	81	5 87
07	5 38	32	5 55	57	5 71	82	5 88
08	5 39	33	5 55	58	5 72	83	5 89
09	5 39	34	5 56	59	5 73	84	5 89
8 10	5 40	35	5 57	8 60	5 73	85	5 90
11	5 41	36	5 57	61	5 74	86	5 91
12	5 41	37	5 58	62	5 75	87	5 91
13	5 42	38	5 59	63	5 75	88	5 92
14	5 43	39	5 59	64	5 76	89	5 93
15	5 43	8 40	5 60	65	5 77	8 90	5 93
16	5 44	41	5 61	66	5 77	91	5 94
17	5 45	42	5 61	67	5 78	92	5 95
18	5 45	43	5 62	68	5 79	93	5 95
19	5 46	44	5 63	69	5 79	94	5 96
8 20	5 47	45	5 63	8 70	5 80	95	5 97
21	5 47	46	5 64	71	5 81	96	5 97
22	5 48	47	5 65	72	5 81	97	5 98
23	5 49	48	5 65	73	5 82	98	5 99
24	5 49	49	5 66	74	5 83	99	5 99

TABLE I.—*Amounts of Weekly Compensation at the Rate of 66 $\frac{2}{3}$ Per Cent. of Average Weekly Wages — Continued.**\$9 to \$9.99, inclusive.*

Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.
\$9 00	\$6 00	\$9 25	\$6 17	\$9 50	\$6 33	\$9 75	\$6 50
01	6 01	26	6 17	51	6 34	76	6 51
02	6 01	27	6 18	52	6 35	77	6 51
03	6 02	28	6 19	53	6 35	78	6 52
04	6 03	29	6 19	54	6 36	79	6 53
05	6 03	9 30	6 20	55	6 37	9 80	6 53
06	6 04	31	6 21	56	6 37	81	6 54
07	6 05	32	6 21	57	6 38	82	6 55
08	6 05	33	6 22	58	6 39	83	6 55
09	6 06	34	6 23	59	6 39	84	6 56
9 10	6 07	35	6 23	9 60	6 40	85	6 57
11	6 07	36	6 24	61	6 41	86	6 57
12	6 08	37	6 25	62	6 41	87	6 58
13	6 09	38	6 25	63	6 42	88	6 59
14	6 09	39	6 26	64	6 43	89	6 59
15	6 10	9 40	6 27	65	6 43	9 90	6 60
16	6 11	41	6 27	66	6 44	91	6 61
17	6 11	42	6 28	67	6 45	92	6 61
18	6 12	43	6 29	68	6 45	93	6 62
19	6 13	44	6 29	69	6 46	94	6 63
9 20	6 13	45	6 30	9 70	6 47	95	6 63
21	6 14	46	6 31	71	6 47	96	6 64
22	6 15	47	6 31	72	6 48	97	6 65
23	6 15	48	6 32	73	6 49	98	6 65
24	6 16	49	6 33	74	6 49	99	6 66

\$10 to \$10.99, inclusive.

\$10 00	\$6 67	\$10 25	\$6 83	\$10 50	\$7 00	\$10 75	\$7 17
01	6 67	26	6 84	51	7 01	76	7 17
02	6 68	27	6 85	52	7 01	77	7 18
03	6 69	28	6 85	53	7 02	78	7 19
04	6 69	29	6 86	54	7 03	79	7 19
05	6 70	10 30	6 87	55	7 03	10 80	7 20
06	6 71	31	6 87	56	7 04	81	7 21
07	6 71	32	6 88	57	7 05	82	7 21
08	6 72	33	6 89	58	7 05	83	7 22
09	6 73	34	6 89	59	7 06	84	7 23
10 10	6 73	35	6 90	10 60	7 07	85	7 23
11	6 74	36	6 91	61	7 07	86	7 24
12	6 75	37	6 91	62	7 08	87	7 25
13	6 75	38	6 92	63	7 09	88	7 25
14	6 76	39	6 93	64	7 09	89	7 26
15	6 77	10 40	6 93	65	7 10	10 90	7 27
16	6 77	41	6 94	66	7 11	91	7 27
17	6 78	42	6 95	67	7 11	92	7 28
18	6 79	43	6 95	68	7 12	93	7 29
19	6 79	44	6 96	69	7 13	94	7 29
10 20	6 80	45	6 97	10 70	7 13	95	7 30
21	6 81	46	6 97	71	7 14	96	7 31
22	6 81	47	6 98	72	7 15	97	7 31
23	6 82	48	6 99	73	7 15	98	7 32
24	6 83	49	6 99	74	7 16	99	7 33

TABLE I. — *Amounts of Weekly Compensation at the Rate of 66 $\frac{2}{3}$ Per Cent. of Average Weekly Wages — Continued.**\$11 to \$11.99, inclusive.*

Wages per Week.	Weekly Compen- sation.	Wages per Week.	Weekly Compen- sation.	Wages per Week.	Weekly Compen- sation.	Wages per Week.	Weekly Compen- sation.
\$11 00	\$7 33	\$11 25	\$7 50	\$11 50	\$7 67	\$11 75	\$7 83
01	7 34	26	7 51	51	7 67	76	7 84
02	7 35	27	7 51	52	7 68	77	7 85
03	7 35	28	7 52	53	7 69	78	7 85
04	7 36	29	7 53	54	7 69	79	7 86
05	7 37	11 30	7 53	55	7 70	11 80	7 87
06	7 37	31	7 54	56	7 71	81	7 87
07	7 38	32	7 55	57	7 71	82	7 88
08	7 39	33	7 55	58	7 72	83	7 89
09	7 39	34	7 56	59	7 73	84	7 89
11 10	7 40	35	7 57	11 60	7 73	85	7 90
11	7 41	36	7 57	61	7 74	86	7 91
12	7 41	37	7 58	62	7 75	87	7 91
13	7 42	38	7 59	63	7 75	88	7 92
14	7 43	39	7 59	64	7 76	89	7 93
15	7 43	11 40	7 60	65	7 77	11 90	7 93
16	7 44	41	7 61	66	7 77	91	7 94
17	7 45	42	7 61	67	7 78	92	7 95
18	7 45	43	7 62	68	7 79	93	7 95
19	7 46	44	7 63	69	7 79	94	7 96
11 20	7 47	45	7 63	11 70	7 80	95	7 97
21	7 47	46	7 64	71	7 81	96	7 97
22	7 48	47	7 65	72	7 81	97	7 98
23	7 49	48	7 65	73	7 82	98	7 99
24	7 49	49	7 66	74	7 83	99	7 99

\$12 to \$12.99, inclusive.

\$12 00	\$8 00	\$12 25	\$8 17	\$12 50	\$8 33	\$12 75	\$8 50
01	8 01	26	8 17	51	8 34	76	8 51
02	8 01	27	8 18	52	8 35	77	8 51
03	8 02	28	8 19	53	8 35	78	8 52
04	8 03	29	8 19	54	8 36	79	8 53
05	8 03	12 30	8 20	55	8 37	12 80	8 53
06	8 04	31	8 21	56	8 37	81	8 54
07	8 05	32	8 21	57	8 38	82	8 55
08	8 05	33	8 22	58	8 39	83	8 55
09	8 06	34	8 23	59	8 39	84	8 56
12 10	8 07	35	8 23	12 60	8 40	85	8 57
11	8 07	36	8 24	61	8 41	86	8 57
12	8 08	37	8 25	62	8 41	87	8 58
13	8 09	38	8 25	63	8 42	88	8 59
14	8 09	39	8 26	64	8 43	89	8 59
15	8 10	12 40	8 27	65	8 43	12 90	8 60
16	8 11	41	8 27	66	8 44	91	8 61
17	8 11	42	8 28	67	8 45	92	8 61
18	8 12	43	8 29	68	8 45	93	8 62
19	8 13	44	8 29	69	8 46	94	8 63
12 20	8 13	45	8 30	12 70	8 47	95	8 63
21	8 14	46	8 31	71	8 47	96	8 64
22	8 15	47	8 31	72	8 48	97	8 65
23	8 15	48	8 32	73	8 49	98	8 65
24	8 16	49	8 33	74	8 49	99	8 66

TABLE I. — *Amounts of Weekly Compensation at the Rate of 66 $\frac{2}{3}$ Per Cent. of Average Weekly Wages — Concluded.**\$13 to \$13.99, inclusive.*

Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.	Wages per Week.	Weekly Compensation.
\$13 00	\$3 67	\$13 25	\$8 83	\$13 50	\$9 00	\$13 75	\$9 17
01	8 67	26	8 84	51	9 01	76	9 17
02	8 68	27	8 85	52	9 01	77	9 18
03	8 69	28	8 85	53	9 02	78	9 19
04	8 69	29	8 86	54	9 03	79	9 19
05	8 70	13 30	8 87	55	9 03	13 80	9 20
06	8 71	31	8 87	56	9 04	81	9 21
07	8 71	32	8 88	57	9 05	82	9 21
08	8 72	33	8 89	58	9 05	83	9 22
09	8 73	34	8 89	59	9 06	84	9 23
13 10	8 73	35	8 90	13 60	9 07	85	9 23
11	8 74	36	8 91	61	9 07	86	9 24
12	8 75	37	8 91	62	9 08	87	9 25
13	8 75	38	8 92	63	9 09	88	9 25
14	8 76	39	8 93	64	9 09	89	9 26
15	8 77	13 40	8 93	65	9 10	13 90	9 27
16	8 77	41	8 94	66	9 11	91	9 27
17	8 78	42	8 95	67	9 11	92	9 28
18	8 79	43	8 95	68	9 12	93	9 29
19	8 79	44	8 96	69	9 13	94	9 29
13 20	8 80	45	8 97	13 70	9 13	95	9 30
21	8 81	46	8 97	71	9 14	96	9 31
22	8 81	47	8 98	72	9 15	97	9 31
23	8 82	48	8 99	73	9 15	98	9 32
24	8 83	49	8 99	74	9 16	99	9 33

\$14 to \$15 inclusive.

\$14 00	\$9 33	\$14 25	\$9 50	\$14 50	\$9 67	\$14 75	\$9 83
01	9 34	26	9 51	51	9 67	76	9 84
02	9 35	27	9 51	52	9 68	77	9 85
03	9 35	28	9 52	53	9 69	78	9 85
04	9 36	29	9 53	54	9 69	79	9 86
05	9 37	14 30	9 53	55	9 70	14 80	9 87
06	9 37	31	9 54	56	9 71	81	9 87
07	9 38	32	9 55	57	9 71	82	9 88
08	9 39	33	9 55	58	9 72	83	9 89
09	9 39	34	9 56	59	9 73	84	9 89
14 10	9 40	35	9 57	14 60	9 73	85	9 90
11	9 41	36	9 57	61	9 74	86	9 91
12	9 41	37	9 58	62	9 75	87	9 91
13	9 42	38	9 59	63	9 75	88	9 92
14	9 43	39	9 59	64	9 76	89	9 93
15	9 43	14 40	9 60	65	9 77	14 90	9 93
16	9 44	41	9 61	66	9 77	91	9 94
17	9 45	42	9 61	67	9 78	92	9 95
18	9 45	43	9 62	68	9 79	93	9 95
19	9 46	44	9 63	69	9 79	94	9 96
14 20	9 47	45	9 63	14 70	9 80	95	9 97
21	9 47	46	9 64	71	9 81	96	9 97
22	9 48	47	9 65	72	9 81	97	9 98
23	9 49	48	9 65	73	9 82	98	9 99
24	9 49	49	9 66	74	9 83	99	9 99
						15 00	10 00

TABLE II. — *Length of Term for Compensation Payments in Cases limited by the Maximum of \$4,000 arranged by 1-Cent Gradations Weekly Compensation between \$8 and \$10.*

\$8 to \$8.99, inclusive.

Weekly Compensation.	LENGTH OF TERM.		Weekly Compensation.	LENGTH OF TERM.		Weekly Compensation.	LENGTH OF TERM.	
	Weeks.	Days.		Weeks.	Days.		Weeks.	Days.
\$8 00	500	-	\$8 35	479	.29	\$8 70	459	5.39
01	499	2.63	36	478	3.28	71	459	1.69
02	498	5.27	37	477	6.28	72	458	5.01
03	498	.92	38	477	2.29	73	458	1.33
04	497	3.59	39	476	5.31	74	457	4.66
05	496	6.26	8 40	476	1.33	75	457	1.00
06	496	1.95	41	475	4.37	76	456	4.35
07	495	4.64	42	475	.41	77	456	.70
08	495	.35	43	474	3.47	78	455	4.07
09	494	3.06	44	473	6.53	79	455	.44
8 10	493	5.79	45	473	2.61	8 80	454	3.82
11	493	1.53	46	472	5.69	81	454	.21
12	492	4.27	47	472	1.78	82	453	3.60
13	492	.03	48	471	4.89	83	453	.01
14	491	2.80	49	471	1.00	84	452	3.42
15	490	5.58	8 50	470	4.12	85	451	6.84
16	490	1.37	51	470	.25	86	451	3.27
17	489	4.17	52	469	3.38	87	450	6.71
18	488	6.98	53	468	6.53	88	450	3.15
19	488	2.80	54	468	2.69	89	449	6.61
8 20	487	5.63	55	467	5.85	8 90	449	3.07
21	487	1.47	56	467	2.03	91	448	6.54
22	486	4.33	57	466	5.21	92	448	3.01
23	486	.19	58	466	1.40	93	447	6.50
24	485	3.06	59	465	4.60	94	447	2.99
25	484	5.94	8 60	465	.81	95	446	6.49
26	484	1.83	61	464	4.03	96	446	3.00
27	483	4.73	62	464	.26	97	445	6.51
28	483	.64	63	463	3.50	98	445	3.04
29	482	3.56	64	462	6.74	99	444	6.57
8 30	481	6.49	65	462	2.99			
31	481	2.43	66	461	6.26			
32	480	5.38	67	461	2.53			
33	480	1.34	68	460	5.81			
34	479	4.31	69	460	2.09			

TABLE II. — *Length of Term for Compensation Payments in Cases limited by the Maximum of \$4,000 arranged by 1-Cent Gradations Weekly Compensation between \$8 and \$10 — Concluded.*

\$9 to \$10, inclusive.

Weekly Compensation.	LENGTH OF TERM.		Weekly Compensation.	LENGTH OF TERM.		Weekly Compensation.	LENGTH OF TERM.	
	Weeks.	Days.		Weeks.	Days.		Weeks.	Days.
\$9 00	444	3.11	\$9 35	427	5.65	\$9 70	412	2.60
01	443	6.60	36	427	2.45	71	411	6.62
02	443	3.21	37	426	6.26	72	411	3.66
03	442	6.77	38	426	3.07	73	411	.70
04	442	3.34	39	425	6.89	74	410	4.74
05	441	6.92	9 40	425	3.72	75	410	1.79
06	441	3.51	41	425	.56	76	409	5.85
07	441	.10	42	424	4.40	77	409	2.91
08	440	3.70	43	424	1.25	78	408	6.98
09	440	.31	44	423	5.10	79	408	4.06
9 10	439	3.92	45	423	1.96	9 80	408	1.14
11	439	.54	46	422	5.83	81	407	5.23
12	438	4.17	47	422	2.70	82	407	2.32
13	438	.81	48	421	6.59	83	406	6.42
14	437	4.46	49	421	3.47	84	406	3.53
15	437	1.11	9 50	421	.37	85	406	.64
16	436	4.77	51	420	4.27	86	405	4.76
17	436	1.43	52	420	1.18	87	405	1.88
18	435	5.11	53	419	5.09	88	404	6.01
19	435	1.79	54	419	2.01	89	404	3.14
9 20	434	5.48	55	418	5.94	9 90	404	.28
21	434	2.17	56	418	2.87	91	403	4.43
22	433	5.88	57	417	6.81	92	403	1.58
23	433	2.59	58	417	3.75	93	402	5.74
24	432	6.30	59	417	.71	94	402	2.90
25	432	3.03	9 60	416	4.67	95	402	.07
26	431	6.76	61	416	1.63	96	401	4.25
27	431	3.50	62	415	5.60	97	401	1.42
28	431	.24	63	415	2.58	98	400	5.61
29	430	3.99	64	414	6.57	99	400	2.80
9 30	430	.75	65	414	3.55	10 00	400	-
31	429	4.52	66	414	.53			
32	429	1.29	67	413	4.55			
33	428	5.07	68	413	1.56			
34	428	1.86	69	412	5.58			

TABLE III. — *Present Value at $4\frac{1}{2}$ Per Cent. Interest Compounded Annually, of the Remainder of an Original Benefit of \$1 per Week for 500 Weeks.*

Time since Beginning of Benefit (Weeks).	Re-remaining Time to run (Weeks).	Present Value of \$1 per Week for Re-remainder of Period.	Time since Beginning of Benefit (Weeks).	Re-remaining Time to run (Weeks).	Present Value of \$1 per Week for Re-remainder of Period.	Time since Beginning of Benefit (Weeks).	Re-remaining Time to run (Weeks).	Present Value of \$1 per Week for Re-remainder of Period.
0	500	\$407.507						
1	499	406.852	56	444	\$369.964	111	389	\$331.317
2	498	406.197	57	443	369.277	112	388	330.598
3	497	405.541	58	442	368.590	113	387	329.878
4	496	404.884	59	441	367.902	114	386	329.157
5	495	404.227	60	440	367.214	115	385	328.436
6	494	403.569	61	439	366.525	116	384	327.714
7	493	402.911	62	438	365.835	117	383	326.991
8	492	402.252	63	437	365.145	118	382	326.268
9	491	401.593	64	436	364.454	119	381	325.544
10	490	400.933	65	435	363.763	120	380	324.820
11	489	400.272	66	434	363.071	121	379	324.095
12	488	399.611	67	433	362.378	122	378	323.369
13	487	398.949	68	432	361.685	123	377	322.643
14	486	398.287	69	431	360.991	124	376	321.916
15	485	397.624	70	430	360.297	125	375	321.188
16	484	396.961	71	429	359.602	126	374	320.460
17	483	396.297	72	428	358.906	127	373	319.731
18	482	395.633	73	427	358.210	128	372	319.002
19	481	394.968	74	426	357.513	129	371	318.272
20	480	394.302	75	425	356.816	130	370	317.541
21	479	393.636	76	424	356.118	131	369	316.810
22	478	392.969	77	423	355.419	132	368	316.078
23	477	392.302	78	422	354.720	133	367	315.346
24	476	391.634	79	421	354.021	134	366	314.613
25	475	390.966	80	420	353.321	135	365	313.879
26	474	390.296	81	419	352.620	136	364	313.145
27	473	389.627	82	418	351.919	137	363	312.410
28	472	388.957	83	417	351.217	138	362	311.675
29	471	388.286	84	416	350.514	139	361	310.939
30	470	387.615	85	415	349.811	140	360	310.202
31	469	386.943	86	414	349.107	141	359	309.465
32	468	386.271	87	413	348.403	142	358	308.727
33	467	385.598	88	412	347.698	143	357	307.988
34	466	384.925	89	411	346.992	144	356	307.249
35	465	384.251	90	410	346.286	145	355	306.509
36	464	383.576	91	409	345.579	146	354	305.768
37	463	382.901	92	408	344.872	147	353	305.027
38	462	382.225	93	407	344.164	148	352	304.285
39	461	381.549	94	406	343.455	149	351	303.543
40	460	380.872	95	405	342.746	150	350	302.800
41	459	380.195	96	404	342.036	151	349	302.056
42	458	379.517	97	403	341.326	152	348	301.312
43	457	378.838	98	402	340.615	153	347	300.567
44	456	378.159	99	401	339.903	154	346	299.821
45	455	377.479	100	400	339.191	155	345	299.075
46	454	376.799	101	399	338.478	156	344	298.329
47	453	376.118	102	398	337.765	157	343	297.582
48	452	375.436	103	397	337.051	158	342	296.834
49	451	374.754	104	396	336.336	159	341	296.085
50	450	374.071	105	395	335.621	160	340	295.336
51	449	373.388	106	394	334.905	161	339	294.586
52	448	372.704	107	393	334.189	162	338	293.835
53	447	372.020	108	392	333.472	163	337	293.081
54	446	371.335	109	391	332.754	164	336	292.332
55	445	370.650	110	390	332.036	165	335	291.579

TABLE III. — *Present Value at $4\frac{1}{2}$ Per Cent. Interest Compounded Annually, of the Remainder of an Original Benefit of \$1 per Week for 500 Weeks — Continued.*

Time since Beginning of Benefit (Weeks).	Re-maining Time to run (Weeks).	Present Value of \$1 per Week for Re-mainder of Period.	Time since Beginning of Benefit (Weeks).	Re-maining Time to run (Weeks).	Present Value of \$1 per Week for Re-mainder of Period.	Time since Beginning of Benefit (Weeks).	Re-maining Time to run (Weeks).	Present Value of \$1 per Week for Re-mainder of Period.
166	334	\$290.826	221	279	\$248.406	276	224	\$203.966
167	333	290.072	222	278	247.616	277	223	203.139
168	332	289.318	223	277	246.826	278	222	202.311
169	331	288.563	224	276	246.035	279	221	201.482
170	330	287.807	225	275	245.243	280	220	200.653
171	329	287.051	226	274	244.450	281	219	199.823
172	328	286.294	227	273	243.657	282	218	198.992
173	327	285.536	228	272	242.863	283	217	198.160
174	326	284.778	229	271	242.069	284	216	197.328
175	325	284.019	230	270	241.274	285	215	196.495
176	324	283.259	231	269	240.478	286	214	195.661
177	323	282.499	232	268	239.682	287	213	194.827
178	322	281.738	233	267	238.885	288	212	193.992
179	321	280.976	234	266	238.087	289	211	193.156
180	320	280.214	235	265	237.288	290	210	192.320
181	319	279.451	236	264	236.489	291	209	191.483
182	318	278.688	237	263	235.689	292	208	190.645
183	317	277.924	238	262	234.889	293	207	189.807
184	316	277.159	239	261	234.088	294	206	188.968
185	315	276.394	240	260	233.286	295	205	188.128
186	314	275.628	241	259	232.484	296	204	187.287
187	313	274.861	242	258	231.681	297	203	186.446
188	312	274.094	243	257	230.877	298	202	185.604
189	311	273.326	244	256	230.073	299	201	184.761
190	310	272.557	245	255	229.268	300	200	183.917
191	309	271.788	246	254	228.462	301	199	183.073
192	308	271.018	247	253	227.655	302	198	182.228
193	307	270.247	248	252	226.848	303	197	181.382
194	306	269.476	249	251	226.040	304	196	180.536
195	305	268.704	250	250	225.231	305	195	179.689
196	304	267.931	251	249	224.422	306	194	178.841
197	303	267.158	252	248	223.612	307	193	177.992
198	302	266.384	253	247	222.801	308	192	177.143
199	301	265.609	254	246	221.990	309	191	176.293
200	300	264.834	255	245	221.178	310	190	175.442
201	299	264.058	256	244	220.365	311	189	174.590
202	298	263.282	257	243	219.552	312	188	173.738
203	297	262.505	258	242	218.738	313	187	172.885
204	296	261.727	259	241	217.923	314	186	172.031
205	295	260.949	260	240	217.108	315	185	171.177
206	294	260.170	261	239	216.292	316	184	170.322
207	293	259.390	262	238	215.475	317	183	169.466
208	292	258.611	263	237	214.658	318	182	168.610
209	291	257.830	264	236	213.840	319	181	167.753
210	290	257.048	265	235	213.021	320	180	166.895
211	289	256.266	266	234	212.201	321	179	166.036
212	288	255.483	267	233	211.381	322	178	165.177
213	287	254.699	268	232	210.560	323	177	164.317
214	286	253.915	269	231	209.738	324	176	163.456
215	285	253.130	270	230	208.916	325	175	162.594
216	284	252.344	271	229	208.093	326	174	161.732
217	283	251.558	272	228	207.269	327	173	160.869
218	282	250.771	273	227	206.444	328	172	160.005
219	281	249.983	274	226	205.619	329	171	159.140
220	280	249.195	275	225	204.793	330	170	158.275

CITIES, TOWNS AND COUNTIES UNDER THE ACT.

Returns of Votes cast upon the Question of the Acceptance or Rejection of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Cities at the Municipal Elections of 1913-14.

CITIES.	Date of Action.	Result of Action.	Yes.	No.
Attleboro,	Mar. 2, 1914	Accepted,	1,213	370
Beverly,	Dec. 9, 1913	Accepted,	1,721	452
Boston,	Jan. 13, 1914	Accepted,	45,547	12,614
Brockton,	Dec. 8, 1914	Accepted,	6,083	2,381
Cambridge,	Mar. 10, 1914	Accepted,	7,808	1,323
Chelsea,	Dec. 9, 1913	Accepted,	3,016	497
Chicopee,	Dec. 8, 1914	Accepted,	1,911	325
Everett,	Dec. 9, 1913	Accepted,	2,204	594
Fall River,	Dec. 2, 1913	Accepted,	6,624	2,804
Fitchburg,	Dec. 2, 1913	Accepted,	3,112	994
Gloucester,	Dec. 2, 1913	Accepted,	1,712	679
Haverhill,	Dec. 2, 1913	Accepted,	4,035	1,280
Holyoke,	Dec. 2, 1913	Accepted,	4,448	1,337
Lawrence,	Dec. 9, 1913	Accepted,	5,749	1,964
Lowell,	Dec. 9, 1913	Accepted,	8,422	3,063
Lynn,	Dec. 9, 1913	Accepted,	9,132	3,189
Malden,	Dec. 9, 1913	Accepted,	3,539	1,001
Marlborough,	Dec. 2, 1913	Accepted,	1,312	595
Medford,	Dec. 9, 1913	Accepted,	1,805	491
Melrose,	Dec. 9, 1913	Accepted,	1,530	608
New Bedford,	Dec. 2, 1913	Accepted,	5,943	2,952
Newburyport,	Dec. 9, 1913	Accepted,	1,254	513
Newton,	Dec. 9, 1913	Accepted,	2,954	912
North Adams,	Dec. 16, 1913	Accepted,	1,712	586
Northampton,	Dec. 2, 1913	Accepted,	1,364	549
Pittsfield,	Dec. 2, 1913	Accepted,	2,266	836
Quincy,	Dec. 2, 1913	Accepted,	2,436	1,010
Revere,	Mar. 2, 1914	Accepted,	2,004	359
Salem,	Dec. 9, 1913	Accepted,	3,714	1,337
Somerville,	Dec. 9, 1913	Accepted,	5,561	1,524
Springfield,	Dec. 2, 1913	Accepted,	5,715	1,241
Taunton,	Dec. 2, 1913	Accepted,	2,649	1,174
Waltham,	Dec. 2, 1913	Accepted,	2,409	857
Woburn,	Dec. 9, 1913	Accepted,	1,640	444
Worcester,	Dec. 9, 1913	Accepted,	11,055	3,154

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15.

TOWNS.	Date of Action.	Result.	Yes.	No.
Abington, . . .	Mar. 9, 1914	Accepted, . . .	379	114
Acton, . . .	Mar. 30, 1914	Accepted, . . .	107	28
Acushnet, . . .	Mar. 1, 1915	Accepted, . . .	55	27
Adams, . . .	Mar. 2, 1914	Accepted, . . .	916	191
Agawam, . . .	Mar. 2, 1914	Accepted, . . .	198	59
Alford, . . .	Mar. 23, 1914	Rejected, . . .	13	18
Amesbury, . . .	Mar. 1, 1915	Accepted, . . .	538	310
Amherst, . . .	Mar. 2, 1914	Accepted, . . .	515	189
Andover, . . .	Mar. 2, 1914	Accepted, . . .	393	135
Arlington, . . .	Mar. 2, 1914	Accepted, . . .	643	203
Ashburnham, . . .	Mar. 1, 1915	Accepted, . . .	96	47
Ashby, . . .	Apr. 15, 1914	Accepted, . . .	1	0
Ashfield, . . .	Mar. 2, 1914	Accepted, . . .	40	20
Ashland, . . .	Mar. 1, 1915	Accepted, . . .	134	65
Athol, . . .	Mar. 1, 1915	Accepted, . . .	845	355
Auburn, . . .	- -	- -	-	-
Avon, . . .	Mar. 3, 1914	Accepted, . . .	122	32
Ayer, . . .	Apr. 6, 1914	Accepted, . . .	217	68
Barnstable, . . .	Mar. 1, 1915	Accepted, . . .	328	141
Barre, . . .	Mar. 1, 1915	Accepted, . . .	119	70
Becket, . . .	Mar. 17, 1914	Accepted, . . .	52	30
Bedford, . . .	Mar. 2, 1914	Accepted, . . .	104	46
Belchertown, . . .	Mar. 2, 1914	Accepted, . . .	81	55
Bellingham, . . .	Mar. 2, 1914	Accepted, . . .	67	33
Belmont, . . .	Mar. 2, 1914	Accepted, . . .	324	104
Berkley, . . .	- -	- -	-	-
Berlin, . . .	Mar. 2, 1914	Rejected, . . .	0	37
Bernardston, . . .	- -	- -	-	-
Billerica, . . .	Mar. 28, 1914	Rejected, . . .	150	278
Blackstone, . . .	Mar. 21, 1914	Accepted, . . .	60	14
Blandford, . . .	- -	- -	-	-
Bolton, . . .	Mar. 2, 1914	Accepted, . . .	40	31
Bourne, . . .	Mar. 2, 1914	Accepted, . . .	192	52
Boxborough, . . .	Feb. 1, 1915	Accepted, . . .	1	0

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

TOWNS.	Date of Action.	Result.	Yes.	No.
Boxford, . . .	Mar. 2, 1914	Accepted,	26	1
Boylston, . . .	Mar. 2, 1914	Rejected,	18	25
Braintree, . . .	Mar. 2, 1914	Accepted,	439	143
Brewster, . . .	Mar. 1, 1915	Accepted,	6	1
Bridgewater, . .	Mar. 7, 1914	Accepted,	289	101
Brimfield, . . .	Mar. 23, 1914	Accepted,	45	29
Brookfield, . . .	— —	— — —	—	—
Brookline, . . .	Mar. 5, 1914	Accepted,	1,547	480
Buckland, . . .	Mar. 2, 1914	Accepted,	108	44
Burlington, . . .	Mar. 2, 1914	Accepted,	34	32
Canton, . . .	Mar. 2, 1914	Accepted,	306	116
Carlisle, . . .	Mar. 2, 1914	Accepted,	34	24
Carver, . . .	Mar. 2, 1914	Accepted,	19	17
Charlemont, . . .	— —	— — —	—	—
Charlton, . . .	Mar. 1, 1915	Accepted,	125	92
Chatham, . . .	Feb. 1, 1915	Accepted,	7	3
Chelmsford, . . .	Mar. 23, 1914	Accepted,	197	130
Cheshire, . . .	Mar. 23, 1914	Accepted,	141	45
Chester, . . .	Mar. 1, 1915	Accepted,	71	26
Chesterfield, . .	Mar. 2, 1914	Accepted,	21	4
Chilmark, . . .	Mar. 9, 1914	Rejected,	0	3
Clarksburg, . . .	Jan. 26, 1915	Rejected,	17	19
Clinton, . . .	Mar. 2, 1914	Accepted,	1,012	335
Cohasset, . . .	Mar. 2, 1914	Accepted,	191	91
Colrain, . . .	Mar. 2, 1914	Accepted,	89	50
Concord, . . .	Mar. 30, 1914	Accepted,	414	181
Conway, . . .	Mar. 2, 1914	Accepted,	66	36
Cummington, . .	Mar. 1, 1915	Accepted,	39	37
Dalton, . . .	Feb. 8, 1915	Accepted,	332	93
Dana, . . .	Mar. 2, 1914	Accepted,	38	33
Danvers, . . .	Mar. 23, 1914	Accepted,	563	301
Dartmouth, . . .	Mar. 2, 1914	Accepted,	193	135
Dedham, . . .	Mar. 2, 1914	Accepted,	647	265
Deerfield, . . .	Mar. 2, 1914	Accepted,	103	37

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

Towns.	Date of Action.	Result.	Yes.	No.
Dennis, . . .	Mar. 15, 1915	Rejected,	4	35
Dighton, . . .	- -	- - -	-	-
Douglas, . . .	Mar. 16, 1914	Accepted,	139	59
Dover, . . .	- -	- - -	-	-
Dracut, . . .	Mar. 2, 1914	Accepted,	182	121
Dudley, . . .	Apr. 6, 1914	Accepted,	201	68
Dunstable, . . .	Mar. 2, 1914	Rejected,	13	16
Duxbury, . . .	Mar. 7, 1914	Accepted,	132	56
East Bridgewater, . .	Mar. 14, 1914	Accepted,	94	22
East Longmeadow, . .	Mar. 9, 1914	Accepted,	60	22
Eastham, . . .	Feb. 1, 1915	Rejected,	0	20
Easthampton, . . .	Mar. 9, 1914	Accepted,	563	222
Easton, . . .	Mar. 2, 1914	Accepted,	259	99
Edgartown, . . .	Feb. 8, 1915	Accepted,	90	45
Egremont, . . .	Mar. 1, 1915	"Yes" and "No" votes not counted in warrant accepted by town.	-	-
Enfield, . . .	Mar. 16, 1914	Accepted,	53	19
Erving, . . .	Mar. 2, 1914	Accepted,	46	0
Essex, . . .	Mar. 2, 1914	Accepted,	59	17
Fairhaven, . . .	Mar. 2, 1914	Accepted,	305	141
Falmouth, . . .	Feb. 17, 1914	Accepted,	270	74
Florida, . . .	- -	- - -	-	-
Foxborough, . . .	Mar. 2, 1914	Accepted,	190	64
Framingham, . . .	Mar. 2, 1914	Accepted,	1,110	360
Franklin, . . .	Mar. 2, 1914	Accepted,	329	86
Free town, . . .	Mar. 30, 1914	Accepted,	29	27
Gardner, . . .	Mar. 2, 1914	Accepted,	963	210
Gay Head, . . .	Mar. 17, 1914	Accepted,	14	0
Georgetown, . . .	Mar. 9, 1914	Accepted,	119	48
Gill, . . .	Mar. 2, 1914	Rejected,	0	18
Goshen, . . .	Mar. 2, 1914	Accepted,	1	0
Gosnold, . . .	Mar. 8, 1915	Rejected by unanimous vote,	0	42
Grafton, . . .	Mar. 2, 1914	Accepted,	209	85
Granby, . . .	Feb. 15, 1915	Rejected,	38	42
Granville, . . .	Mar. 8, 1915	Accepted,	26	16

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

TOWNS.	Date of Action.	Result.	Yes.	No.
Great Barrington, . . .	Mar. 16, 1914	Accepted,	438	169
Greenfield,	Mar. 2, 1914	Accepted,	1,180	184
Greenwich,	Mar. 30, 1914	Rejected,	18	22
Groton,	— —	— — —	—	—
Groveland,	Mar. 8, 1915	Accepted,	80	31
Hadley,	Mar. 1, 1915	Accepted,	54	36
Halifax,	Mar. 1, 1915	Accepted,	32	11
Hamilton,	Mar. 9, 1915	Accepted,	160	54
Hampden,	Mar. 16, 1914	Accepted,	28	23
Hancock,	Mar. 2, 1914	Accepted,	26	11
Hanover,	Mar. 2, 1914	Accepted,	76	29
Hanson,	Mar. 1, 1915	Accepted,	107	41
Hardwick,	Mar. 7, 1914	Accepted,	44	29
Harvard,	Mar. 16, 1914	Rejected,	20	56
Harwich,	Feb. 8, 1915	Rejected,	0	101
Hatfield,	Mar. 16, 1914	Rejected,	57	67
Hawley,	— —	— — —	—	—
Heath,	Mar. 1, 1915	Rejected,	0	40
Hingham,	Mar. 1, 1915	Accepted,	231	81
Hinsdale,	Mar. 30, 1914	Accepted,	52	30
Holbrook,	Mar. 1, 1915	Accepted,	181	71
Holden,	Mar. 16, 1914	Accepted,	116	52
Holland,	Feb. 8, 1915	Rejected,	0	22
Holliston,	Mar. 2, 1914	Accepted,	228	103
Hopedale,	Mar. 2, 1914	Rejected,	14	41
Hopkinton,	Mar. 2, 1914	Accepted,	161	61
Hubbardston,	— —	— — —	—	—
Hudson,	Mar. 2, 1914	Accepted,	506	150
Hull,	Mar. 1, 1915	Accepted,	20	0
Huntington,	Mar. 2, 1914	Accepted,	120	31
Ipswich,	Mar. 2, 1915	Accepted,	375	144
Kingston,	Mar. 7, 1914	Accepted,	128	58
Lakeville,	Mar. 2, 1914	Accepted,	40	30
Lancaster,	— —	— — —	—	—

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

TOWNS.	Date of Action.	Result.	Yes.	No.
Lanesborough, . . .	Mar. 23, 1914	Accepted,	83	30
Lee,	Mar. 9, 1914	Accepted,	339	100
Leicester,	Mar. 2, 1914	Accepted,	189	116
Lenox,	Mar. 2, 1914	Accepted,	233	64
Leominster,	Mar. 2, 1914	Accepted,	328	262
Leverett,	Mar. 2, 1914	Accepted,	44	3
Lexington,	Mar. 2, 1914	Accepted,	191	81
Leyden,	Mar. 1, 1915	Accepted,	17	6
Lincoln,	- -	- - -	-	-
Littleton,	Mar. 30, 1914	Accepted,	44	43
Longmeadow,	Mar. 16, 1914	Accepted,	75	15
Ludlow,	Mar. 9, 1914	Accepted,	152	63
Lunenburg,	Mar. 1, 1915	Accepted,	74	68
Lynnfield,	Mar. 8, 1915	Accepted,	118	39
Manchester,	Mar. 2, 1914	Accepted,	231	93
Mansfield,	Mar. 2, 1914	Accepted,	282	138
Marblehead,	Mar. 16, 1914	Accepted,	469	151
Marion,	Mar. 2, 1915	Rejected,	3	25
Marshfield,	Mar. 2, 1914	Accepted,	124	54
Mashpee,	- -	- - -	-	-
Mattapoisett,	Feb. 1, 1915	Accepted,	72	57
Maynard,	Mar. 9, 1914	Accepted,	379	121
Medfield,	Mar. 1, 1915	Accepted,	152	60
Medway,	Mar. 2, 1914	Accepted,	167	61
Mendon,	Mar. 2, 1914	Accepted,	63	17
Merrimac,	Mar. 1, 1915	Accepted,	125	51
Methuen,	Mar. 2, 1914	Accepted,	654	250
Middleborough,	Mar. 2, 1914	Accepted,	380	252
Middlefield,	Mar. 1, 1915	Rejected,	4	10
Middleton,	- -	- - -	-	-
Milford,	Mar. 2, 1914	Accepted,	777	233
Millbury,	Mar. 16, 1914	Accepted,	231	112
Millis,	Mar. 1, 1915	Accepted,	111	38
Milton,	Mar. 2, 1914	Accepted,	626	176

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

TOWNS.	Date of Action.	Result.	Yes.	No.
Monroe,	Mar. 19, 1914	Accepted,	10	5
Monson,	Apr. 6, 1914	Accepted,	292	113
Montague,	— —	— — — —	—	—
Monterey,	Mar. 30, 1914	Accepted,	21	13
Montgomery,	Mar. 30, 1914	Rejected,	0	17
Mount Washington,	Mar. 23, 1914	Rejected,	0	9
Nahant,	Mar. 21, 1914	Accepted,	118	56
Nantucket,	Feb. 9, 1914	Accepted,	267	83
Natick,	Mar. 1, 1915	Accepted,	1,183	413
Needham,	Mar. 2, 1914	Accepted,	363	115
New Ashford,	Mar. 30, 1914	Accepted,	9	0
New Braintree,	Mar. 1, 1915	Rejected,	4	12
New Marlborough,	Mar. 16, 1914	Accepted,	73	52
New Salem,	Mar. 2, 1914	Accepted,	33	9
Newbury,	Mar. 2, 1915	Accepted,	81	71
Norfolk,	— —	— — — —	—	—
North Andover,	Mar. 2, 1914	Accepted,	361	141
North Attleborough,	Mar. 16, 1914	Accepted,	731	268
North Brookfield,	Feb. 8, 1915	Accepted,	181	55
North Reading,	Mar. 2, 1914	Accepted,	84	33
Northborough,	Mar. 1, 1915	Accepted,	120	66
Northbridge,	Apr. 6, 1914	Accepted,	404	76
Northfield,	— —	— — — —	—	—
Norton,	Mar. 2, 1914	Accepted,	126	61
Norwell,	Mar. 2, 1914	Accepted,	82	30
Norwood,	Mar. 2, 1914	Accepted,	547	120
Oak Bluffs,	Mar. 3, 1914	Accepted,	73	19
Oakham,	— —	— — — —	—	—
Orange,	Mar. 2, 1914	Accepted,	477	160
Orleans,	Feb. 1, 1915	Accepted,	17	11
Otis,	Mar. 9, 1914	Accepted,	14	1
Oxford,	Mar. 1, 1915	Accepted,	210	119
Palmer,	Mar. 23, 1914	Accepted,	84	12
Paxton,	Mar. 2, 1914	Rejected,	18	23

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

Towns.	Date of Action.	Result.	Yes.	No.
Peabody,	Mar. 9, 1914	Accepted,	1,258	416
Pelham,	Mar. 9, 1914	Rejected,	14	25
Pembroke,	Mar. 2, 1914	Accepted,	95	18
Pepperell,	- -	- - -	-	-
Peru,	Mar. 2, 1914	Accepted,	7	2
Petersham,	Mar. 1, 1915	Accepted,	49	36
Phillipston,	Mar. 2, 1914	Accepted,	16	0
Plainfield,	Mar. 9, 1914	Rejected by voice vote. "Yea" and "Nay" vote not declared.	-	-
Plainville,	Mar. 1, 1915	Accepted,	92	59
Plymouth,	Mar. 7, 1914	Accepted,	789	197
Plympton,	- -	- - -	-	-
Prescott,	Mar. 9, 1914	Rejected,	0	1
Princeton,	Mar. 2, 1915	Accepted,	12	11
Provincetown,	Feb. 9, 1914	Accepted,	116	65
Randolph,	Mar. 1, 1915	Accepted,	457	101
Raynham,	Mar. 9, 1914	Accepted,	45	35
Reading,	Mar. 2, 1914	Accepted,	353	110
Rehoboth,	Mar. 2, 1914	Accepted,	44	38
Richmond,	Mar. 30, 1914	Rejected,	18	20
Rochester,	- -	- - -	-	-
Rockland,	Mar. 9, 1914	Accepted,	608	139
Rockport,	Mar. 2, 1914	Accepted,	130	47
Rowe,	Mar. 1, 1915	Rejected,	1	17
Rowley,	Mar. 9, 1914	Accepted,	83	38
Royalston,	Mar. 2, 1914	Accepted,	18	4
Russell,	Mar. 3, 1914	Accepted,	74	10
Rutland,	Feb. 1, 1915	Accepted,	54	52
Salisbury,	- -	- - -	-	-
Sandisfield,	- -	- - -	-	-
Sandwich,	Mar. 1, 1915	Accepted,	110	60
Saugus,	Mar. 2, 1914	Accepted,	318	109
Savoy,	Feb. 1, 1915	Rejected,	2	17
Scituate,	Mar. 2, 1914	Accepted,	224	87

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

TOWNS.	Date of Action.	Result.	Yes.	No.
Seekonk, . . .	- -	- - -	-	-
Sharon, . . .	Mar. 3, 1914	Accepted, . . .	158	71
Sheffield, . . .	Mar. 30, 1914	Accepted, . . .	132	67
Shelburne, . . .	Mar. 2, 1914	Accepted, . . .	113	67
Sherborn, . . .	Mar. 2, 1914	Accepted, . . .	86	33
Shirley, . . .	Mar. 23, 1914	Accepted, . . .	74	37
Shrewsbury, . . .	Mar. 2, 1914	Accepted, . . .	100	79
Shutesbury, . . .	Mar. 16, 1914	Accepted by acclamation, . . .	2	0
Somerset, . . .	Mar. 2, 1914	Accepted, . . .	108	50
South Hadley, . . .	Mar. 16, 1914	Accepted, . . .	292	86
Southampton, . . .	- -	- - -	-	-
Southborough, . . .	Mar. 1, 1915	Accepted, . . .	104	52
Southbridge, . . .	Mar. 2, 1914	Accepted, . . .	830	204
Southwick, . . .	Mar. 30, 1914	Accepted, . . .	59	40
Spencer, . . .	Apr. 6, 1914	Accepted, . . .	462	188
Sterling, . . .	Mar. 2, 1914	Accepted, . . .	96	34
Stockbridge, . . .	Feb. 1, 1915	Accepted, . . .	131	48
Stoneham, . . .	Mar. 2, 1914	Accepted, . . .	425	122
Stoughton, . . .	Mar. 2, 1914	Accepted, . . .	423	113
Stow, . . .	Mar. 16, 1914	Accepted, . . .	30	27
Sturbridge, . . .	Mar. 2, 1914	Accepted, . . .	53	40
Sudbury, . . .	Mar. 23, 1914	Accepted, . . .	58	51
Sunderland, . . .	Mar. 2, 1914	Rejected, . . .	0	45
Sutton, . . .	Mar. 16, 1914	Accepted, . . .	115	68
Swampscott, . . .	Feb. 15, 1915	Accepted, . . .	624	223
Swansea, . . .	Mar. 2, 1914	Rejected, . . .	39	49
Templeton, . . .	Mar. 2, 1914	Accepted, . . .	173	61
Tewksbury, . . .	Mar. 2, 1914	Rejected, . . .	72	77
Tisbury, . . .	Mar. 3, 1914	Accepted, . . .	57	21
Tolland, . . .	Mar. 2, 1914	Rejected, . . .	0	10
Topsfield, . . .	Mar. 1, 1915	Accepted, . . .	86	43
Townsend, . . .	Mar. 1, 1915	Rejected; vote not to accept unanimous.	-	-
Truro, . . .	Feb. 9, 1914	Accepted, . . .	22	11
Tyngsborough, . . .	Mar. 2, 1914	Accepted, . . .	56	25

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Continued.

TOWNS.	Date of Action.	Result.	Yes.	No.
Tyringham, . . .	Mar. 8, 1915	Rejected,	8	11
Upton,	Mar. 2, 1914	Accepted,	79	40
Uxbridge, . . .	Mar. 2, 1914	Accepted,	280	69
Wakefield, . . .	Mar. 31, 1914	Accepted,	87	55
Wales,	Apr. 6, 1914	Accepted,	27	13
Walpole,	Mar. 2, 1914	Accepted,	292	73
Ware,	Mar. 30, 1914	Accepted,	609	135
Wareham,	Mar. 3, 1914	Accepted,	206	78
Warren,	Mar. 2, 1914	Accepted,	218	88
Warwick, ¹	Mar. 2, 1914	Accepted,	8	3
Washington, . . .	Mar. 23, 1914	Accepted,	16	3
Watertown, . . .	Mar. 2, 1914	Accepted,	1,003	316
Wayland,	Feb. 1, 1915	Accepted,	229	84
Webster,	Mar. 2, 1914	Accepted,	710	146
Wellesley,	Mar. 2, 1914	Accepted,	277	69
Wellfleet,	- -	- - -	-	-
Wendell,	Mar. 1, 1915	Accepted,	34	7
Wenham,	Mar. 2, 1914	Accepted,	36	15
West Boylston, . .	Mar. 22, 1915	Rejected,	36	53
West Bridgewater, .	Mar. 2, 1914	Accepted,	62	30
West Brookfield, .	Feb. 8, 1915	Accepted,	87	38
West Newbury, . .	Mar. 2, 1914	Accepted,	106	63
West Springfield, .	Mar. 23, 1914	Accepted,	792	181
West Stockbridge, .	- -	- - -	-	-
West Tisbury, . .	- -	- - -	-	-
Westborough, . . .	Mar. 1, 1915	Accepted,	323	121
Westfield,	Mar. 9, 1914	Accepted,	1,225	373
Westford,	Mar. 16, 1914	Accepted,	74	37
Westhampton, . . .	Mar. 2, 1914	Accepted,	20	14
Westminster, . . .	- -	- - -	-	-
Weston,	Mar. 30, 1914	Accepted,	68	12
Westport,	Mar. 9, 1914	Accepted,	103	100
Westwood,	Mar. 2, 1914	Accepted,	71	32
Weymouth,	Mar. 2, 1914	Accepted,	649	214

Returns of Votes cast upon the Question of the Acceptance of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Towns at the Annual Meetings of 1914-15 — Concluded.

TOWNS.	Date of Action.	Result.	Yes.	No.
Whately, . . .	Feb. 1, 1915	Accepted,	23	17
Whitman, . . .	Mar. 7, 1914	Accepted,	538	158
Wilbraham, . .	Mar. 9, 1914	Accepted,	86	28
Williamsburg, .	Mar. 2, 1914	Accepted,	115	74
Williamstown, .	Mar. 23, 1914	Accepted,	235	78
Wilmington, . .	Mar. 2, 1914	Accepted,	66	26
Winchendon, . .	Mar. 2, 1914	Accepted,	303	175
Winchester, . .	Mar. 2, 1914	Accepted,	546	199
Windsor, . . .	Mar. 9, 1914	Accepted,	13	7
Winthrop, . . .	Mar. 23, 1914	Rejected,	25	51
Worthington, . .	Feb. 1, 1915	Accepted,	38	27
Wrentham, . . .	Mar. 1, 1915	Accepted,	96	46
Yarmouth, . . .	Feb. 9, 1914	Accepted,	72	33

Returns of the Total Number of Votes cast upon the Question of the Acceptance or Rejection of Chapter 807 of the Acts of 1913, being "An Act to provide for compensating Certain Public Employees for Injuries sustained in the Course of their Employment," submitted to the Voters of the Several Counties of the Commonwealth at the State Election held Nov. 4, 1913, and canvassed by the County Commissioners.

COUNTY.	Yes.	No.	COUNTY.	Yes.	No.
Barnstable, . . .	1,614	616	Hampshire, . . .	4,127	1,603
Berkshire, . . .	6,210	2,059	Middlesex, . . .	53,049	16,704
Bristol,	17,656	6,786	Nantucket, . . .	246	66
Dukes,	280	116	Norfolk,	14,168	4,329
Essex,	33,277	11,700	Plymouth, . . .	11,363	2,926
Franklin,	2,811	956	Suffolk,	52,073	12,777
Hampden,	16,149	4,423	Worcester, . . .	26,992	7,911

UNUSUAL PROCEDURE IN CERTAIN CASES.

The Industrial Accident Board does not hesitate to do the unusual thing, if this will expedite the adjustment of claims under the Workmen's Compensation Act.

The committee of arbitration has frequently visited the employee in his room and taken his testimony while he remained in bed, so that there should be no delay in the settlement of his case and in the payment of compensation.

Cases have been tried in hospitals, and at the proper time the committee has listened to the employee's story, giving him the advantage of telling his story under proper and restful surroundings, and without the ordeal of a half day in the hearing room of the Board.

When it has been the part of wisdom to hear a case in the manufacturing plant in which the employee was injured, in order to understand the evidence and to avoid any chance of error, the committee has, at great inconvenience to its members, held its meeting in the place of employment and reached a decision before it left the premises.

PROSECUTIONS FOR FAILURE TO REPORT ACCIDENTS.

By the provisions of section 13, Part III. of chapter 751, Acts of 1911, as amended by section 1, chapter 746, Acts of 1913, —

Every employer shall hereafter keep a record of all injuries, fatal or otherwise, received by his employees in the course of their employment. Within forty-eight hours, not counting Sundays and legal holidays, after the occurrence of an injury, a report thereof shall be made in writing to the industrial accident board on blanks to be procured from the board for the purpose. Upon the termination of the disability of the injured employee, the employer shall make a supplemental report upon blanks to be procured from the board for that purpose. If the disability extends beyond the period of sixty days, the employer shall report to the board at the end of such period that the injured employee is still disabled, and upon the termination of the disability shall file a final supplemental report as provided above. . . . Any employer who refuses or neglects to make the report required by this section shall be punished by a fine of not more than fifty dollars for each offence.

It is of the utmost importance to the full and equitable administration of the workmen's compensation law that all injuries to employees, whether insured or not, be promptly reported to the Board as required by the above provision of the act. In this way only can the Board ascertain whether the employee is entitled to compensation and whether the insurer, if any, is meeting his obligations. Many injuries which at first seem trivial have resulted in serious disability and sometimes in death.

The question whether or not the injury arose out of and in the course of the employment, and whether some form of disease is an injury under the act, is to be decided, not by the employer, but through the machinery provided by the act, and justice can be done to the employees of the State only through a thorough compliance with this provision of the law for reporting accidents.

Realizing that in the beginning there was bound to be considerable misunderstanding and lack of knowledge in reference

to this provision of the law, the Board has not sought to be technical in its enforcement, but has first made certain that any failure to comply with its provisions was willful before instituting prosecution in the courts.

During the past year three cases of failure to report accidents have been prosecuted by the Board, one each in the Suffolk, Essex and Berkshire counties, and in each case a conviction was secured. Several other cases are now pending. The Board still adheres to its policy of equitable leniency, but believes that after more than two years of actual operation this provision of the act should be reasonably well known to the employers of the State. An increasing compliance with the provisions of the law in this respect is noted by the Board, and it is pleased to say that it is being fully observed by the great majority of the employers of the State.

PERSONAL INJURIES BY DISEASES OF OCCUPATION.

The payment of compensation for personal injuries to employees which arise out of and in the course of their employment is under the jurisdiction of the Industrial Accident Board, and in connection with this duty the Board receives during the course of a year many reports of "personal injuries" which are occasioned by reason of the nature, circumstances or conditions of the employment. These injuries are what are known as occupational diseases.

Early in the history of the Workmen's Compensation Act the Board interpreted the words "personal injury" as referring to occupational diseases as well as industrial accidents, and was sustained by the decision of the Supreme Judicial Court in the Hurle and Johnson cases. Since the decisions referred to were handed down by the court, insurers have almost invariably paid compensation to all employees who were incapacitated for work by reason of occupational diseases arising out of and in the course of their employment.

A brief study of the reports of such diseases made to the Industrial Accident Board for the past year may be of interest. In all, 362 were registered, — 354 non-fatal and 8 fatal cases. They are grouped into three main divisions: (1) those due to harmful substances causing constitutional disturbances; (2) those due to harmful conditions; and (3) those due to irritant fluids and substances resulting in local affections.

In the first group are 36 non-fatal and 4 fatal cases. Of the non-fatal, one resulted from the use of arsenate of soda in a chemical plant. Dusty trades were responsible for three. A man thirty-seven years old, employed as a grinder in a machine shop, developed tuberculosis, and a miller was incapacitated for a month by the inhalation of dust. An employee of a sand mill died as a result of stone grinder's phthisis. Physical impairments from the inhalation of gases, vapors or fumes occurred to workers in various industries; for example, a lumper in a dry-color factory suffered from nitric acid fumes, a wire temperer from gas, and a worker in a leather factory

from gas and odors evolved during the manufacture of the product. The six cases of anthrax were divided evenly among longshoremen and employees in leather factories. The incapacity resulting extended over periods varying from three to seven and a half weeks. From such a standpoint, therefore, these non-fatal cases for the year were not as serious as others reported in the past, and in which incapacity extended over a period of two years. There were, however, two deaths reported from anthrax, one of an employee in a tannery and the other of a longshoreman. The number of cases of lead poisoning were 19, distributed as follows: painters, 9; type-setters, 2; printers, 1; machinists, 1; plumbers, 1; color matchers, 1; workers in white lead, 1; employees in storage battery forming rooms, 1; jewelry workers, 1; tree sprayers, 1. The most serious case was that of a painter sixty-four years of age whose hand, arm and shoulder were partially paralyzed, and who has been unable to do any work for a year. A fatal case was that of a paint grinder in a paint factory. The other death in this group was that of a man engaged in mixing paint and who inhaled corrosive sublimate.

Taken as a whole, this group of non-fatal cases shows a wage loss of \$4,325 and a total disability of 2,013 days.

In the second main group are included cases arising from exposure to the elements as well as those due to harmful conditions arising from the manner in which the work is performed and resulting in injuries to nerves, muscles or bones. For example, it was reported that an inspector in a plant in which electrical goods are manufactured suffered eye strain from the constant use of a jeweler's glass. Two elevator attendants had neuritis; a machinist and a coppersmith, synovitis; and a stenographer, arthritis. There were 125 non-fatal and 2 fatal cases due to extreme cold and 20 non-fatal cases and 3 deaths due to extreme heat.

As a result of the non-fatal accidents in this second general classification the total number of days' work lost was 3,587, with an accompanying wage loss of \$7,036.

In the third group are 165 cases of local affections due to the nature of the materials used in the occupations involved

or to the manner of performing the work in question. They are distributed as follows: brass, 3; chrome, 25; cyanide and plating solutions, 6; dust, 16; hides, 15; lime, 6; oil, 6; paint, 4; poisonous vines, etc., 7; raw wool, 11; washing and cleansing fluids, 6; local irritations, 17; miscellaneous, 43. Polishers of brass used in the manufacture of various articles were the ones reported as having brass poisoning. Of the 25 cases of chrome poisoning, tanneries contributed 16; leather factories, 5; dye houses of textile mills, 3; and the etching room of a newspaper plant, 1. The workers in jewelry, wire and metal factories were the ones exposed to cyanide and plating solutions. All but three of the poisonings by dyestuffs occurred in textile plants. The remainder were distributed as follows: millinery salesgirl, 1; shoe welter, 1; employee in a color department of a tannery, 1. All those affected by the handling of hides or raw wool were employed in tanneries or leather factories as were those who suffered from the use of lime, with the exception of one wire drawer in a steel mill. Five of the six cases of oil boils occurred in steel and wire plants. The four cases under the heading "paint" were infections and were not associated with lead poisoning. Those who came into contact with poisonous vines, etc., such as ivy and dogwood, were naturally laborers and carpenters whose work exposed them. In the miscellaneous group are included such cases as cane sores, poisoning from the vanilla bean, wood alcohol as used by tip repairers in shoe factories, or from copper grease as used by wire drawers. In this group as a whole the total disability days amounted to 2,533, and the loss in wages to \$4,221.

Regrouping in a general way the occupational diseases under the industries in which they occurred we get the following results: from the manufacture of leather and its finished product, 72, including anthrax, lime, raw wool, chrome, hides, dyes and extreme cold; from trade, 42, the great majority being frost bites; from iron and steel mills and other metal trades, 46, including lead, dusts, strains, oil, gases and fumes, lime, plating solutions and extreme cold; from textiles, 28, due for the most part to dyes, chrome and washing fluids; from build-

ing and hand trades, 17, including lead, gases, paint and miscellaneous; from food preparers, 12, all except 2 being due to extreme heat or cold, as were most of those in construction and maintenance of streets, street railways and ice harvesting. Other industries reported 6 cases or less.

For all the 354 non-fatal diseases it works out that 8,133 days' work was lost, or that 22 people were constantly disabled for the year. The total wage lost was \$15,582.

During the year the Board has been called upon to give hearings in several cases involving occupational diseases. That of Employee No. 872 brings out the connection between occupation and tuberculosis. The employee was engaged in grinding material used in a sand mill. By inhaling small particles of stone and dust he contracted fibroid tuberculosis, usually called stone grinder's phthisis; because of this his lungs became consolidated and as a result he died. Compensation was awarded his widow.

A rather unusual case was that of Employee No. 390. She worked in the "cool room" of a candy factory in which the temperature was kept at from 60° to 65°. She developed facial paralysis, — a peripheral nerve affection, — the only cause for which in a girl of her age could be cold or exposure. On a report to that effect by medical experts a finding was made for the employee.

In other contested cases compensation was awarded a wire drawer who had eczema and a cigar maker who suffered from occupational neurosis.

In conclusion it may be stated that although this is not in any sense intended as a survey of occupational diseases in Massachusetts, but merely as a brief summary of those reported during the past year to the Industrial Accident Board, it serves as an indication of the great variety of occupations, materials and conditions that may bring about physical impairments justly termed occupational diseases, and the extent of the loss in earning capacity attributable to them.

VOLUNTARY CO-OPERATION IN UNUSUAL CASES.

Insurers have shown a spirit of co-operation in the handling of unusual cases, and have accepted recommendations of members, not having the force of law, in such cases, especially in connection with injuries which required further and more skillful medical attendance than the employee could afford to provide.

Many such cases have been taken up with the insurers by members of the Board, after consultation with an expert medical adviser, and upon receipt of the Board's suggestion as to the necessities of the case favorable action has usually been had.

This is in line with the policy of the Board to aid in restoring employees to full earning capacity at the earliest possible moment consistent with good recovery, and has been as advantageous to insurers as to employees. The spirit of co-operation shown, however, is worthy of comment and acknowledgment.

THE MEDICAL ADVISER OF THE BOARD.

The Great and General Court of 1914, by the passage of chapter 708, section 15, in effect June 25, 1914, authorized the Industrial Accident Board to appoint a medical adviser, subject to confirmation by the Governor and Council. The Board selected Francis D. Donoghue, M.D., and the appointment was confirmed by the proper authorities. The selection of the Board was received with approval by the medical profession of the Commonwealth.

The need of a medical adviser was apparent from the beginning. The medical advisory committee, a body of seven physicians, consisting of two from the Massachusetts Medical Society, two from the Homœopathic Medical Society and three physicians appointed at large by the Board, recognized this need soon after its organization, and favored the recommendation which the Industrial Accident Board made to the Legislature, — that authority for the appointment of such an adviser be given.

The duties of the medical adviser embrace the systematization of all the vast amount of medical information required under the Workmen's Compensation Act; advice with reference to all medical problems; supervision over the work of impartial examining physicians; direct, expert help and testimony in certain exceptional cases; the outlining of the essential medical facts required to decide whether disputed non-fatal and fatal cases are covered by the law; and the preparation of such cases impartially for hearing, in order that the provisions of the act may be made effective speedily and with the least possible cost and annoyance to the parties at interest.

One of the serious difficulties which the Board has encountered in passing upon certain cases is the deficient type of medical report which has been furnished by physicians. Such reports often are misleading or inaccurate by reason of the fact that a correct history is not obtained and the examiner has not been careful in the use of terminology in referring to the effects of industrial injury with relation to the employee's incapacity

for work. Take the case of an employee whose physician gives him a certificate that he is suffering from a sprained ankle, the result of an injury arising out of and in the course of his employment. That certificate, unaccompanied by any explanation, is of little aid to the Board in passing upon the case. If every swollen ankle is described as a sprained ankle, injustice will be done. The word "sprained" implies an injury, while a "swollen" ankle may be consistent with an injury, or come from many causes having no relation to a personal injury arising out of the employment.

Another deficiency which occurs is lack of consideration as to the date of the alleged happening with reference to the development of immediate or subsequent effects. For instance, if a physician is asked: "Can a blow cause a fracture?" the answer almost invariably is "yes." This answer is given, usually without considering the place that was injured by the blow, with reference to the immediate or subsequent complaint. The kind, direction and location of violence applied should be an immediate consideration in each report.

It was noted that there was a tendency among certain physicians acting for employee or insurer to exaggerate in giving testimony before the Board in the early history of the law. This tendency has been checked by the employment of impartial expert physicians, selected by the Board, whose reports have been made fairly and without regard to whether the truth affected adversely either side to the controversy.

It is the duty of the examining physician to approach an employee with a mind that is open, and to base his report upon a careful history, examination and consideration of the case. Each case should be considered on its own set of facts, and the examiner should give full weight to the sequence of events in relation to violence, the kind of violence, the place at which such violence was applied, and the important and subsequent effects.

The Board frequently deals with cases in which alcoholism or syphilis are influenced or aggravated by some occupational happening, or in which the tendency towards other disease is materially accelerated thereby. A definite statement as to the

influence of the specific injury or disease which arises out of and in the course of the employment upon the alcoholic, syphilitic, or other previously existing condition should be made in the report which is supplied the Board.

The provision for further medical and hospital care, in "unusual" cases, subsequent to the original period of two weeks, in effect Oct. 1, 1914, indicates a desire on the part of the Legislature to extend the period during which the insurer should furnish such care, under certain "unusual" circumstances. With the increase in medical expense necessitated by this amendment should come corresponding decreases in the amounts paid out in compensation in serious injury cases, since the effect of further skillful medical and hospital care in this type of cases should be to keep down to the minimum the amount paid in compensation benefits.

There is a large number of cases which have been treated at hospitals as "house" cases, and which have been discharged to the out-patient department for further care, which are neglected by reason of the lack of a proper follow-up system between the house and the out-patient departments. Among these are injuries to the hand, arm, leg, etc., such as dislocations or fractures, in which, if personal interest had been shown and proper instruction given the patient, the period of disability would have been shortened and the employee restored more quickly to his usual employment.

There is a group of cases, small in number, in which the injury occurs when the employee is in what may be termed the "twilight zone" of life, in a general way above the age of 60, in which the advantages of a proper follow-up system, between the two departments of a hospital, or the furnishing of skillful treatment after the first two weeks, would result in a definite shortening of the time of working incapacity.

It should be borne in mind, in connection with the actual physical incapacity caused by an injury, that in many cases a mental condition also is created which causes the employee to believe that he cannot longer do the things he previously did, and makes it difficult to bring about a cure except under the most skillful and experienced care.

The form which a report of an examination should take is important, in the consideration of disputed cases under the statute, and the following outline is suggested for the guidance of those who have to do with the examination of industrial accident cases: —

Name.

Address, street and No., city or town.

Age.

Date of injury.

Date of examination.

Name of employer.

Name of insurer.

Nature of employment.

Previous injury, illness, etc., description of.

Nature of present injury.

Weight: Before, after injury.

Immediate effects: How long in hospital; how long in bed.

When able to go first to doctor's office.

Present complaints.

Disability as shown by examination.

Examination.

Opinion: First as to relation of occupational happening to present condition. Ability to work; whether complete recovery, or partial; if the latter, what kind of work is employee able to perform.

The following of such a form in the preparation of a report for use under the Workmen's Compensation Act will be of great service to the Board in its consideration of the rights of the parties thereunder.

The duties of the Board's medical adviser are many and onerous, and the physicians and surgeons of the Commonwealth can be of the greatest possible aid in the proper accomplishment of the work if they will make effective, so far as possible, the suggestions put forward in this statement.

RESULTS OF IMPARTIAL EXAMINATIONS.

The following statement has been prepared by Dr. Francis D. Donoghue, medical adviser, at the request of the Industrial Accident Board, and is of interest because it shows the manner in which cases assigned for impartial examination should be approached and the relation of the impartial examiner to such cases under the Workmen's Compensation Act:—

The establishment of the Workmen's Compensation Act in Massachusetts has brought into existence not only a new method of adjudicating claims for industrial injuries, but also has created synchronously a new and broader field for expert medical service. Two important objects of this law are as follows:—

First.—Injured employees should receive the best medical treatment possible, whereby they may be returned to industry with the least delay.

Second.—Compensation should be paid promptly, when an injury “arises out of and in the course of employment;” should be continued during incapacity for work; and should not be paid when there is no connection between disability and the occupation, or when there is no disability remaining.

As an active force in fostering the spirit of this law the medical profession has the opportunity of rendering a great service. Under the law the Industrial Accident Board has the power of appointing impartial physicians whose advice is taken by the Board on medical questions having to do with treatment, the relation between injury and death, or incapacity, and the cessation or continuance of disability. The majority of cases referred to impartial physicians have involved in them an element of dispute between the insurance company and the injured employee or his dependents. In those cases where one or both of the parties are relying on the opinion of a physician, the opinion of the impartial examiner must be carefully formed. When a physician gives wrong advice in perfectly good faith there is raised a point of dispute which otherwise probably would not occur. This results in friction, delay and injustice to one side or the other.

A clear statement of what is found, a correct diagnosis and the visualization of an injured employee as he is, under working conditions, are essentials to the sort of medical report which is necessary in passing upon cases under the act.

Anything short of this when acted upon, for the time taken in arriving at the true situation, decreases the efficiency of the administration of the act. For every report of this nature which is eliminated efficiency is increased.

From observation in numerous cases examined as an impartial physician prior to becoming medical adviser, certain reasons stand out as an explanation of the absence in some cases of a proper diagnosis, or of the proper application thereof.

Those reasons which stand out as being worth special emphasis are stated below:—

1. In giving treatment there is a possible tendency to overlook details and the relationship of various existent factors which later may be extremely important in passing upon subsequent conditions.

2. A habit of mind acquired from examining cases under the old law in effect prior to the Workmen's Compensation Act may tend to inhibit that process of deductive reasoning so essential under the theory of a compensation system.

3. There is danger in failing to realize that a surgical cure is not necessarily a functional cure; or when this fact is grasped, in not making the matter clear in the report.

4. When there are pre-existing conditions of infirmity the real effect of the injury may be given too great or too little weight.

5. The importance of occupational diseases and other forms of incapacity due to working conditions and materials is not always realized. In these cases considerable care is required to determine whether the industry is the primary or secondary cause of disability, or in no way responsible.

6. At times the conditions as found may not be all reported, on the assumption that there is no relevance from a legal point of view. Although a knowledge of the act is essential to the best type of report, any assumption that tends to obscure medically what appears to be extraneous legally is beyond the scope of the examiner's duties, and sometimes leads into error.

By and large, the elimination of those causes which increase rather than decrease the number of disputes between the parties under the Workmen's Compensation Act is highly essential. Costs of administration must be kept within reasonable bounds. Insurance companies desire, and should be aided in every way, to understand and to discharge fully their obligations under the law. Injured persons should not be misled into believing that they are more injured than the facts really show. The importance of having these principles carried out is doubtless recognized by all. The medical profession is in a position to be of incalculable service to the successful administration of the act passed by the Legislature for the benefit of the employees of the Commonwealth. Much valuable work has been done, but the aim should always be in the direction of still greater accomplishment.

In the next few pages reference is made to certain cases which have come to the attention of the writer while acting in behalf of the Board as impartial examiner and voluntary adviser. These cases may prove

of interest and value in connection with the subject under discussion. A few of these cases are cited below:—

Case of H. L.—In this case the insurance company had stopped compensation and the man was examined by me in October, 1913. The accident happened on Nov. 1, 1912. The employee fell from a staging onto a concrete floor, alighting on his left heel. He had no treatment except massage. The date when compensation was stopped was June 23, 1913.

Examination by X-ray showed a fracture of the os calcis, which was accompanied by formation or development of bony spurs, with a resultant disablement for the performance of the ordinary work of carpenter. Later the employee was operated upon twice at the Massachusetts General Hospital, and on Jan. 1, 1915, was still unable to go to work.

Case of X.—This case was referred for examination by an arbitration committee. At the hearing both the insurance company's doctor and the attending physician agreed that the man was malingering, but on examination the facts showed that the employee had a definite myositis of the deltoid muscle accompanied by painful spasm.

This was a case in which the man had been treated for a long period without examination, and because the man looked well it was assumed that he could work. By reason of the examination made after the hearing treatment directed to the injured muscle was begun, and as a result of this treatment the employee was able to return to work six weeks later.

Case of J. H.—This man was examined by me on Dec. 9, 1913. He gave a history of having been overcome by smoke fumes, and of being taken to the Boston City Hospital for treatment. He stated that there was something wrong with his stomach and his head as a result of the poisoning, and that he was unable to stand on account of dizziness. He also said that while coming from the hospital he had fallen down.

Examination in this case showed an advanced case of tabes. On Oct. 7, 1914, this man again appeared with a report based on an impartial examination. Since his first examination he had been employed by another employer who was insured with another insurance company. At this time he gave the history that in April, 1914, he stubbed his great toe, fell, and as a result injured his right leg and the right side of his head. He gave the history of pain in his leg and weakness. He denied any previous claim under the Workmen's Compensation Act, and gave the history of having been operated upon by the doctor representing the insurance company for the removal of varicose veins. He still complained, however, of weakness in his legs. The impartial doctor appointed by the Board as a result of his examination had ordered a bandage for the varicose condition; also this man was examined by an impartial doctor before the Board. All told, he had been examined

four times and operated on once without the diagnosis of tabes having been made.

Case of F. F. — This man was injured on July 27, 1914, as a result of which he received a fracture of both bones of the right forearm with compounding of the right ulna. The case was treated throughout by a doctor representing the insurance company without any X-ray diagnosis of conditions and without the formation of any results. Compensation had been stopped prior to my examination of Oct. 24, 1914, on the ground that while under the influence of liquor he had fallen downstairs, re-breaking his arm.

Examination by the X-ray showed an ununited fracture of the right ulna and a united fracture of the right radius. Based on the X-ray plate it would seem that the direction of the fracture in the ulna and the direction of the fracture in the radius were on different planes, and it is possible in a case of this kind that the treatment that would keep one bone in place would tend to throw the other bone out. Now since in this case the radius had united and the ulna was still thrown out it was hard to understand how the second injury could re-break one bone and not re-break the other. A discussion was held with the insurance company's representative and their doctor. Consideration of the facts and the X-ray plates at this discussion led to the resumption of compensation payments and to an agreement to pay for an operation which should restore the arm functionally.

Case of B. M. — The accident in this case occurred on July 9, 1914. The injured employee, a man fifty-six years of age, slipped from the step of a wagon to the ground, and was thrown so that he landed in a doubled-up position. He had suffered pain around his body, and was unable to turn over for two weeks. The doctor representing the insurance company reported him fit for work in October. The employee went back to work for three days shovelling coal; he then strained his back again so severely that he was unable to turn while in bed. As a result of this re-injury he had pain around his body and down his left leg. This employee was examined by me on Nov. 24, 1914.

The examination showed that the man had a flat, rigid lumbar spine, and evidence of injury to the sacroiliac joints. He had marked spasm of muscles on either side of the lumbar region. The X-ray plate showed a compression and a crushing of the second lumbar vertebra, and this would satisfactorily account for all pain and difficulty that he had. In this case, also, there was probably the added disability which came from injuring an old back which was probably becoming deficient by reason of gradual, stationed difficulty as a result of his years of work.

Case of E. J. C. — Age, twenty-seven. Married, with three children. Accident, July 11, 1914. This man fell about six or seven feet striking

his right side on a girder. He was treated at the Boston City Relief Station, and their examination showed a breaking of the tenth and eleventh ribs, multiple abrasions of the right arm and rupture of the right kidney. He was in the relief hospital three days, and in the City Hospital three days. The injury in this case was aggravated by the fact that the man was told of the rupture of his kidney. The urine in the case cleared up in a few days, and there had been no symptoms referable to the kidneys, hence the man was suffering from a marked fear that the kidney would rupture again if he started to work. To remove this idea from his mind an examination was made which showed myositis of the right lumbar muscle, which was accompanied, on motion, by muscle spasm and localized pain. This is the type of case which needs judicious encouragement. This man needed work to loosen up the back muscles, and he also needed work to prove to him that there would be no resulting danger to the kidney. In other words, the best therapeutic agent in this case for his moral and physical condition was employment.

Case of A. B. — This man, an Italian baker, received an injury by reason of having his hand caught in a machine. As a result of this accident he injured the metacarpal bone of the right hand, with an inflammation of the tendon sheathes over it.

When the period of acute inflammation was over, and it was necessary to start using the hand in order to insure its future usefulness, this man's employer, a woman engaged in the baking business, appeared at the office of the Board with the employee, and she was told the kind of work that would be useful to the man in making a recovery. The woman took it upon herself to see that such work was given, and the man at once passed from a totally incapacitated class to the class where, in addition to what he could earn, partial compensation also was paid.

One point which stands out forcibly as a result of experience in making examinations is the fact that oftentimes a long period of disability may be prevented if a little direct personal interest is taken in the cases of incapacitated employees by employers or surgeons. By way of digression it might be well to state here that the writer has found very little conscious fraud attempted by injured employees. There is not the incentive for a wage earner to remain from employment in the hope of getting large sums of money that existed in times past. Again, the member of the family, usually a woman or child, who can afford to make a claim of an injury extending over a long period, as is seen in ordinary tort cases, does not appear to any great extent under the act because of the fact that those who could afford to lay off are not those engaged in the industries insured. Reverting to the subject of returning employees to industry, and following out the suggestion of establishing a more personal relationship, it appears

that there is needed definite follow-up treatment in accident cases after they leave hospitals. It is all right to give advice to an injured man, but for his good and for the good of the community it would be much better if the proper treatment were given. To my mind one of the most important forms of treatment is massage, when given under proper conditions and not in a begrudging or a hurried hospital manner.

While acting in the capacity of impartial physician it was most interesting, if somewhat arduous, to make as complete a study of each case as time and the conditions under which the examination was made permitted.

In conclusion, the fact should be mentioned that the manner in which the Industrial Accident Board has applied the opinions given to the final determination of the cases referred for examination has been most gratifying.

THE VALUE OF ROUTINE X-RAY EXAMINATIONS.

The following statement was furnished the Board by Dr. Ariel W. George in connection with its request for aid in its consideration of the subject of malingering, in so far as it has been observed by impartial physicians appointed to make examinations in disputed cases. A special chapter is given to the statement, in view of its importance and timeliness.

There is no one means that we have at our disposal more valuable in the diagnosis and treatment of industrial accident cases than the constant routine use of the X-ray. To those who have used the X-ray in these cases, following a thorough and competent examination, it sometimes becomes ludicrous to observe the errors that are made in the accident cases. The type of case, if there is any one type more important than another, that warrants routine examination is that of injury to the heavier parts of the body, such as the head, shoulder, spine, pelvis, hip, knee and even the smaller joints. The diagnosis of injury to these various parts is in a great degree inferential, is not positive, and the error is made as much in the negative direction as in the reverse. For example: in shoulder injuries there may be ecchymosis, crepitus, tenderness, swelling and all the classical picture of a fracture without a real fracture. On the other hand, you may have very few of these symptoms in fractures of the wrist and elbow joints when the fracture is easily visible with the X-ray. There are probably more diagnoses made by the general practitioner of fracture of the ribs than of any other condition without there being an actual fracture, although the treatment of injury or fracture may be the same.

Claims are made that tuberculosis follows injury to the clavicle, sternum or other parts of the bony structure of the thorax. If there had been immediate X-ray examination of the normal condition of the lung at the time of injury it would have been demonstrated. Subsequent changes following the date of the injury could have been studied.

One of the most common sources of error which occurs in injury to the spine is continually overlooked by the practitioner and even the expert, namely, crushing injuries and dislocations of the different anatomical parts of the vertebrae, particularly the twelfth dorsal and the first, second and third lumbar. Injuries to the bony pelvis are not common, are deforming in character and necessitate prompt diagnosis of the actual condition and early treatment.

Injuries to the hip are common, are overlooked, and the deformity becomes permanent, with continued compensation, in cases where evi-

dence could have been obtained by the X-ray and proper treatment given with a large percentage of cures.

In the study of the muscle injuries without fracture of the bones we frequently find myositis ossificans. This is common, is progressive in character, developing tumor masses and causing pain and more or less temporary disuse of the part. The X-ray discloses the condition, and prompt treatment can be instituted with radical cure. Thus it will be seen that the X-ray can aid injuries to the extremities.

It is hoped and it is probably true that most insurance companies wish to get at the exact condition of the injured part in so far as lies within their power, and to cure that injury so that the person will not become an economic loss.

The value of the X-ray in the diagnosis of industrial accident cases needs only one argument in its favor, that is, that it will show injuries which cannot be positively detected by any other known physical means. The worst that can be said about its routine use is the expense. This, however, is negligible as compared with the enormous expense of continued compensation under a mistaken diagnosis.

IMPARTIAL EXAMINATIONS AND MALINGERING.

In connection with the annual report of the Industrial Accident Board the impartial physicians who have aided the Board in obtaining the medical facts and passing upon disputed cases were invited to advise the Board as to the cases of conscious malingering or feigning of incapacity for work which may have come to their notice in connection with their impartial examination of employees under the Workmen's Compensation Act.

Extracts from these statements follow:—

Frederic J. Cotton, M.D.—While I have not found much real malingering I have found a good many cases where patients were undoubtedly afraid to use the injured limb, sometimes from too careful medical care and advice, and sometimes, and this is particularly true among the Italians, on account of an almost superstitious fear of hurting the injured part. There are a lot of these cases who could go to work if they only could think so, but I do not think it quite fair to call them malingerers. There are also a lot of other cases who ought to be at work, but there has been no provision made for the convalescence of the injured limb or part whereby it can be hardened to meet the strain of hard work. It seems to me that under the law this is a more important matter than the comparatively small amount of malingering. No doubt an occasional malingerer gets by, but my own impression is that the number is very small.

William H. Ruddick, M.D.—Several of the cases referred to me, who claimed they were incapacitated for work, were undoubtedly malingerers. I will not attempt to give a long list of diseases which have been feigned, or the means that have been employed by artists in deception. The majority of the cases referred to me for examination are due, particularly, to injuries involving the joints, and many claim they are unable to work by reason of pain or stiffness therein. Some general hints for guidance is all that will be attempted, leaving matters of detail to the acumen of the medical examiner, who, if in active practice, will have many opportunities of testing his powers of discernment.

The impartial examiner will find the following points useful:—

1. Examine each organ of the body separately, carefully comparing the state of each with the symptoms described by the patient.
2. Note the discrepancies in the statements of the patient as to his symptoms and their known occurrence in real disease.
3. Sometimes ask questions the reverse of his statements, or take his statement for granted, when in all probability he will contradict himself.

4. Remove all bandages and other dressings.

5. The motives for deception should be inquired into and borne in mind in the examination of all cases.

F. W. Anthony, M.D. — I have seen very many cases where the self-centering of interest and what I might term self-hypnotism has produced a mental condition that unconsciously gave the injured one an improper attitude toward labor. It seems to be a part of the natural constitution of the majority of people who are sick or injured to magnify their condition. One hears so many times remarks of this nature: "The doctor said he had never seen so serious a case;" "If the cut had gone an inch one side I would have been dead;" and "I do not think any one ever suffered as much as I did," etc. When we add to this natural tendency to exaggeration either a neurotic temperament or one with a low ideal as regards equity we have a combination that tends toward exaggeration.

It is generally easy to determine the question of incapacity when the injury is one giving marked objective symptoms, and, in fact, the more severe the injury the less, as a rule, is there of feigning incapacity. When, on the other hand, the symptoms are entirely subjective the decision is much more difficult. As to the methods of detecting malingerer, — if the question that arises involves definite physical conditions they can almost always be settled by expert examination. For example, the question of the power of sight an oculist can, as a rule, determine with a fair degree of certainty, and such affections of the nervous system as are manifested by organic changes in the nerves or in the muscles supplied by them can be estimated by the expert neurologist, as a rule, at their true value. In the case with only subjective findings, and in such other cases as must be decided by the general practitioner, the best rule that I know is to apply to these cases the ordinary common sense that would obtain in the ordinary affairs of life. In the work which you have kindly requested me to do as impartial physician I have seen but one case where there was even a suspicion of feigning incapacity. In that case a neurologist's examination disclosed no positive evidence of trouble; the man injured evidenced frequently the use of alcohol; there was in his statement a minor something that did not ring true; and finally I came to the opinion that upon consideration of the doctrine of probabilities his incapacity was less than he claimed.

To sum up, my opinion is this: Conscious malingerer is extremely rare. Unconscious exaggeration is very common. To decide the true status requires experience, the possession of a fair amount of common sense, and a temperament judicial in type.

S. E. Fletcher, M.D. — I have found a tendency in several cases to endeavor to prolong the period of incapacity for work and the drawing of compensation beyond the point where one would naturally have

returned to work had there been no compensation. The fact that many injured employees also draw benefits from their union or from some fraternal or benefit society rather tends to prolong the period of incapacity, particularly if the aggregate amounts so received from all sources nearly equal the amount ordinarily earned as wages.

In those cases where differences of opinion between injured employees and the insurance companies have been referred to me for impartial examination, I have based my conclusions on the nature of the injury, the length of time when, under average conditions, recovery should have occurred, the nature of the work ordinarily done by that employee and the effect of the injury on his ability to perform that work, and whether the injured person, in idleness, was making as much physical exertion as would ordinarily be made in doing his regular work. For instance, a person might still be incapacitated for work with comparatively slight remains of an injury if that injury affected the finger or member which was principally used in doing his regular work, while another might be able to work, even though lame from an injury, provided that his usual work was done while sitting or, at least, without the use of that injured member.

William J. Daly, M.D.— Happily that form of physician has not as yet appeared among us who is well known in countries in which social legislation is older than in our own, and more particularly known in Germany as a “*simulanten riechen*,” literally, one who smells out a dissembler, and denoting in a concrete sense a physician who is always finding or expecting to find simulation or malingering, and the conditions do not call for him.

Indeed, any one who has had much to do with injuries of workmen will have waning faith in human nature revived. If such an observer has had familiarity with the brazen type of malingerer, with which railroads and great corporations have to put up, he will be refreshed with the workman type period.

In the workman out and out malingering is rare, except in one or two instances, as in the case of the individual who, the subject of trivial accident, sees fit to put forward old serious injuries, sustained long ago from causes other than incidental to employment, as being of recent date and sustained in the course of employment.

The time of reception of such injuries, particularly if they involve a special sense, is not always easy to detect.

The ordinary type of malingering workman is he who, fearful that his genuine injury should not be assessed at its true valuation, exaggerates it either consciously or unconsciously.

As a subdivision of this type is the diffident foreigner who, unfamiliar with the language, environment and procedure and distrustful lest the importance of his wound be minimized, finds it best to exaggerate in order that attention may be called to it. The experienced

physician puts him at ease, and little by little arrives at the true amount of lost function, and is able to estimate the economic loss of the man's activities.

In a broad way the detection of pure malingerers is brought about by the showing of inconsistency between statement and function; for example, a man who complains that he cannot use an arm to perform one movement, but readily admits ability to perform a movement which involves the same musculature when he is put in a different position.

Variations of the test concerning, on the physician's part, a knowledge of the anatomy and physiology of the region in question confirms to a certainty that which was previously a suspicion. Nothing need be said to the patient. Lack of remonstrance on the examiner's part leads to elaboration and further confirmation.

In proportion to the whole number seen, the number of malingerers is few, but a small proportion of the 90,000 accidents a year may make numerically a fairly formidable figure.

On the other hand, there is also known the physician, the antithesis of the "simulanten riechen," or fake finder, who always has a good story for his patient. This type of professional man is as well known as the other. In the lands where social insurance flourishes he is much sought. The word is passed among pending, postponed or doubtful cases that he will help, and he, as a result, enjoys a certain clientele.

Deferred hopes and disillusionizing eventually are the rewards of his patients, but wherever insurance laws prevail this type has never failed to rise.

Many pending or postponed cases are moot cases, concerning all manner of technical questions as, for example, whether there exists causal connection between complaint and alleged accident or proven accident. Such form of disability, sometimes put forward in good faith by the patient as the result of an accident, is that of old syphilis which appears coincidentally with an accident or shortly after. How protean these appearances may be, and also how prone to appear after general tonus lowering as, for example, following accident, only those who know tertiary syphilis well can appreciate.

Yet how delicate is the situation involved. The original lesion has been forgotten for years, oftentimes for decades, by the patient, and he is genuine indignation personified. Confirmatory evidences in the nature of laboratory tests, blood tests and others are requested by the fair-minded physician who, although sure of his ground to start with, wishes to clinch all argument by every possible confirmation.

But the significance of such tests is known in the community and among workmen, and it is conceivable that, particularly in a small community, the requests for blood and laboratory tests could work harm to an individual, be he innocent or guilty of this disease. But

in the interest of truth all such squeamishness should be ruthlessly put down, and it should be the duty of all concerned to co-operate in having these tests made, when asked by authoritative special opinion. Sometimes what is thus thought to be accident results is shown to be syphilis. I have seen such cases.

But even good physicians make mistakes, and cases are thereby deferred or postponed unjustifiably, as was shown recently in a case where a perfectly normal appearing man complained of but transitory dizziness and occasional double seeing, and was not vehement in his complaint.

His physician, suspecting malingering, upbraided him after a careful physical examination which showed good musculature, sound organs and all that goes with health, and he further told the man he should go to work. As a matter of fact, the disability was genuine: there existed a crack at the base of the skull, and if the man had returned to his occupation, which was hazardous, he probably, as a result of disability of a special sense organ, would have sustained another serious accident and possibly a fatality.

More cases of malingering are those of the individual who knowingly possesses a senile beginning cataract and brings it in as a result of slight trauma; also the man who, with intrinsic muscular atrophy of the hand, due to syphilis, makes it appear an occupation neurosis, and who knowingly or unknowingly charges it to his work; or again, the case of alleged paralysis agitans following injury in a probably existing case of paralysis agitans associated with a slight injury.

All these are cases which, if allowed to pass as genuine, would assume, in the aggregate, sums which would total large and to which they have no right.

A definition of malingering may be, "a simulation of disease with intent to defraud in terms of money, or to shirk in terms of work."

All these cases I have seen. Their detection is a matter of medical knowledge, general and special, possessed by the well-trained physician, and the application of which, in itself, constitutes a specialty.

Michael F. Fallon, M.D.—Most of the cases which have come to the writer's notice, which have feigned incapacity or exaggerated their symptoms, have been those of hernia,—traumatic hernia.

The writer confines his remarks to that most frequent form of hernia called "inguinal hernia."

A hernia is a protrusion through a congenital or acquired opening in the abdominal wall of some abdominal organ, and in such a way that the organ is covered, in whole or in part, by peritoneum.

A congenital defect or opening, or an acquired enlargement of a congenital opening in the abdominal wall, and a congenital or acquired pouch or sac of peritoneum are the essentials in a hernia.

The exciting cause is generally something which increases the intra-abdominal pressure, *e.g.*, lifting, straining or coughing.

Nearly all abdominal organs have been found in a hernial sac, most commonly the intestine; next in frequency, the omentum. The uterus, ovaries, bladder, appendix and even the kidney (Deipser) have been found in an inguinal hernia.

The term hernia is better than the term rupture, both from a surgical and medico-legal standpoint. The term rupture is an old one given at a time when it was falsely believed that hernia was due to the traumatic tearing or bursting open (rupture) of the abdominal wall.

Of late years surgery and research have shown that nearly always "hernia is a disease rather than an accident" (Kingdon).

A hernia, in all its component parts, implies an opening in the abdominal wall, a protrusion of some abdominal organ, a pouch-like process of the peritoneum covering this abdominal organ, and for the better understanding of this we may compare a hernia, with its contents, to a sword in its scabbard, the scabbard being the hernial covering or peritoneal sac, and the sword being the hernial contents, — the intestine or other abdominal organ.

Although the possibility of the sudden occurrence of a hernia, in all its component parts, cannot be denied, yet such an occurrence is extremely rare.

The writer has observed and operated a large number of hernias, and can recall but two cases of the sudden occurrence of a hernial swelling that might be attributed to trauma; and even in these cases one or more of the component parts of the hernia, *e.g.*, the large opening or sac, may have existed previous to the accident.

In reference to the sudden occurrence of a hernia we believe to be true this statement of Professor Graser, an authority on hernia. "In ninety of one hundred cases the bulging (hernia) will take place gradually; in nine, it will come down in more or less abrupt stages; and in one case it will come down suddenly, as the result of some applied force."

Why is it so difficult and so rare for a hernia, in all its component parts, to occur suddenly? And by the sudden occurrence of a hernia in all its component parts we mean the sudden formation of the sac, of the opening, and of the protrusion of the abdominal organ in the sac.

The peritoneum is attached over and around the internal ring so that the sudden loosening and stretching of this peritoneum, sufficient to form the pouch or sac that is palpable or visible, must be and is, from the nature of this attachment, extremely rare.

It is true that a congenital and even an acquired sac may be present without the possessor's knowledge, and in the presence of such a sac

a protrusion of an abdominal organ may suddenly take place as the result of an exciting cause, *e.g.*, increased abdominal pressure.

A beginning hernia, without the presence of a sac, generally manifests itself by pain, and this pain is due to the stretching of the peritoneum that covers the opening. the internal ring, and this pain is present either in the groin or throughout the abdomen (at times this pain may be mistaken for appendicitis).

Generally, a beginning hernia manifests itself by pain, and the proper application of a truss prevents the further growth of the hernia.

A malingerer may claim to have a hernia when he knows in reality that no hernia is present, and he may even persuade a surgeon to operate for hernia even though he has no hernia. This actually happened to the writer's knowledge.

A Russian, subsequently proven to be a malingerer, came to the hospital for operation for hernia. He had persuaded his physician, who sent him to the hospital, that he had hernia. Upon examination in the hospital no hernia was found, but for fear that a mistake had been made the patient was kept, by the writer, in the hospital under observation for three days.

Various means were used to make a hernia protrude, but no hernia could be found. The man finally persuaded a young surgeon in a distant hospital to operate for hernia, and some time afterward he sued a corporation for damages, basing his claim on the ground of traumatic hernia. It was proven that the claim was fraudulent.

A bulging of the abdominal wall at the site of the inguinal canal that can be plainly seen when the patient strains or coughs is often mistaken for hernia. In reality, it is not a hernia, but a bulging due to weakness of the abdominal wall.

After operation for hernia a patient may claim incapacity because of pain in the scar. I have never known a patient to be incapacitated by reason of this pain in a hernial wound, while there may be some pain in the hernial wound after operation; likewise after other abdominal wounds this pain, provided the operation has been done properly, does not incapacitate.

Examples of all the above cases simulating traumatic hernia have occurred in the writer's practice, *i.e.*, a man fraudulently claiming to have a hernia when no hernia was present; a claim that a hernia was present when in reality it was a bulging of a weak abdominal wall, or a swollen gland, or an abscess, or a fatty tumor, or a hydrocele; and also exaggerating of post-operative (hernia) pain to the extent of claiming incapacity by reason of it.

The writer believes as a result of a somewhat extensive experience with hernia, in both private and hospital practice, that a full understanding of the occurrence of traumatic hernia does not obtain among the laity, and even among some physicians; and he therefore respect-

fully suggests to your honorable Board that if appropriate literature on this subject were disseminated among physicians it would be the means of preventing many fraudulent claims based upon the occurrence of traumatic hernia.

J. J. McNamara, M.D. — To date I have examined four cases for your Board. In two of these — 50 per cent. — I was obliged to report that further compensation be not allowed. Neither of these cases tried to deceive; one was able to work but thought he could get compensation because he was unable to find work. The other case was due to sickness not caused in the course of his employment.

It might be of interest for you to know of our work in connection with the Boot and Shoe Worker's Union whose membership in the Brockton district numbers several thousand. This union pays a sick benefit of \$5 per week for thirteen weeks in any one year to all members in good standing who are entitled to benefits.

It is my duty to investigate every sick claim and to see the claimant once a week until he or she is able to resume work. We have had more than 200 claims a week at times, which means that we must personally see these 200 claimants and pass judgment on their claims. I have been doing this work for about twelve years; during this time we have had many and varied claims.

The rules of the union are few, simple and place no hardships on the members.

First. — The member must be in the union six months and in good standing.

Second. — He must be under the care of a *regular* physician who must see him at least once a week.

Third. — If constitutionally sick he cannot be out after 8 P.M.

Fourth. — Women passing through the menopause on account of which they are unable to work are entitled to one-half benefits only.

Fifth. — Members guilty of intemperance, debauchery or immoral conduct are not entitled to benefit.

There are cases where we know absolutely that the patient is sick or disabled for work, such as the specific fevers, injuries or septic conditions. There are other cases where it is hard to tell, even after careful examination; included in these are the various ills of women, nervousness, general debility, all run down, nervous exhaustion and the convalescents from any and all ailments. A patient tells us that he or she is suffering from any of this class of cases and we are obliged to carefully examine them. We ask: Are you under the care of a regular physician? Who is he? When did you see him last? How long have you been under the care of a physician? What does he say is your trouble? Does he say you are unable to work? Are you taking medicine or having medical treatment? Were you employed when taken ill?

If, after this examination we are satisfied that the claimant is unable

to work, we allow the claim; if we are in doubt, we consult the doctor treating the patient, the factory where employed; we also try to ascertain if the claimant is drawing benefits from any other source; all of these facts have a bearing in doubtful cases. In consulting the attending physician we are, in the majority of cases, treated courteously and honestly. Occasionally, we find a doctor who is trying to cover up something he has done.

Many people in Brockton belong to several fraternal societies which pay sick benefits and they make more money loafing than working; so with unscrupulous people we are apt to have trouble. Some of these fraternal organizations have sick committees, and we sometimes seek their aid in cases where we are doubtful. The sick committees may be able to discover if the claimant is out after 8 P.M., which is the evening time limit, or they may find that the claimant is drinking or doing some work of which we are not aware; so in this way they may be of great assistance to us.

The majority of shoe workers in Brockton and vicinity who apply for sick benefit are honest, upright, conscientious people, but we always have a class who are trying to get something that does not belong to them.

E. Henry Howard, M.D.—The element of conscious malingering entered into but one of the cases sent to me for examination, and the X-ray served to clear away the suspicion.

Thomas F. Carroll, M.D.—An injury in some part of the body, when first sustained and even during the progress of repair, manifests at times many peculiar symptoms, and after the repair is complete these peculiar symptoms continue. During the progress of repair there is an increased impressionability and suggestibility, and conscious impressions are more numerous than in health, and suggest to the patient all kinds of fancies, whims, etc. They are unduly sensitive, self-consciousness is increased, trifles are magnified, and the tendency to become discouraged and despondent is great. The simulation of various morbid conditions is common, and there are many cases of professional malingerers. Functional affections may so closely simulate organic disease that suspicion is often disarmed.

L. R. G. Crandon, M.D.—I know of no instance that seemed to be willful deception. There have been many cases, however, of people over fifty-five years of age who are so tired with a life of hard work that any injury bad enough to make them stop work seems to precipitate down upon them, all at once, the weight of their years. All their subsequent life centers around the injury, their ambition is gone, and they are virtually incapacitated for life by a slight injury which serves as a trigger to discharge old age upon the victim.

I do get the impression in a good many of the employees, particularly in winter, amongst those who come from warm countries, of a tendency

to wait a few weeks longer rather than to stir themselves to try to work. With many injuries there comes a time when active labor is the very best treatment. The law, as written, does not stimulate them to try hard to get well.

The employers would save money if they would take the injured employees back and really and fairly follow the doctors' suggestions. A man recently injured frequently cannot plunge at once into hard labor, but he might earn half pay or do some lighter work and thereby both aid his own recovery and help his employer.

S. A. Mahoney, M.D.—I would say that no malingering has been observed by me. I do not think the injured party returns to work as quickly as if he received no income; that is, his convalescence is more complete on his return to work. I have seen cases of permanent deformity without total disability which have refrained from work when they could have returned and performed some of the cruder manual work, such as handling trucks, etc. In those cases there was a general distrust that, after they returned to work and compensation payments had been stopped, the corporation would discharge them for some trivial offence, or put them at work which they were unable to do. In other words, the old distrust between employer and employee delays the return to work of a few employees.

Philip Kilroy, M.D.—I have considered as conscious malingerers three cases of the number examined by me.

As to the detecting of such malingering I think each one of them, as is usually the case with malingerers, gave a general impression of disingenuousness. While it is true that most victims of accidents endeavor, as is to be expected, to paint their symptoms in strong relief, the malingerer does it in colors so strong as to arouse suspicion—"the lady protests too much;" an actor might feign and be plausible, but I haven't had one of them. Then, on examination, there is a lack of proportion and symmetry between the nature of the accident and the anatomic lesions, on the one hand, and the complaints on the other; the honest neurasthenic may have complaints wholly out of proportion to the injury, but there is a symmetry and accord of the symptoms to one another or each other, and also to be known and established symptomatology of neurasthenia; this harmony is lacking in the malingerer. A physician might feign symptoms consistent with each other and known semeiology, but I haven't had one of them.

In summing up, it isn't the severity or number or absurdity of the symptoms so much, as their inexplicability or unaccountability that characterizes the complaints of the malingerer.

The hysteric may have any complaint or combination of complaints that may have been suggested, but the hysteric is a type of its own, generally easy of recognition.

As a rule, the pretence is so artless as to be amusing. W. J. found a bend in his ribs which he always had, and tried to pass it off as a fracture. T. C. had an operation for a common condition, in his case undoubtedly of long standing, and evidently hoped to have some one else pay for his misfortune.

J. B. Trainor, M.D.—1. There has been, I believe, on the part of all persons whom I have examined for your Board, a disposition more or less marked to magnify their incapacity for work, their sufferings, etc.

2. There frequently is between *perfect* capacity for work and *possible* capacity for work a considerable margin; and when injured persons are being compensated to a degree, which, to them, approximates satisfaction, they are quite certain to remain idle until *perfect* capacity for work is assured.

3. I have known some—three or four—who manifestly were malingerers; of this I have no doubt.

4. There are, so far as I am aware, no positive and unfailing tests for the detection of such dispositions on the part of injured persons. A thorough physical examination should always be made, and with this as a basis one can usually arrive at a just estimate of a case after *painstaking, conscientious* and *sympathetic* communion with the injured party.

John F. O'Brien, M.D.—Of the number of cases I have examined for you I recall but one where the suspicion of malingering came to my mind; that was in regard to a young man somewhat below the average in intelligence, lacking in initiative and ambition, who left with me the impression that he would be perfectly content to drift along on the recompense to which he was entitled rather than rid himself of the infirmity which was disabling him. Such a case as this is not hard to recognize, and as a matter of course advice is given to restore conditions to a normal standard again.

C. J. Leary, M.D.—I cannot recall any instance of deliberate malin-gering. Almost all of the cases which I have seen have been severe injuries, such as fracture of bones, etc. I remember one case upon which I decided unfavorably. This man showed unmistakable signs of tertiary syphilis, and I was confident that the illness from which he was suffering was not due to his accident, which was a comparatively trivial one, but was due to this old trouble, and so I returned an unfavorable report in his case.

John J. McArdle, M.D.—To cite one or two cases. One of my cases was a man who was impressed with what the physician who had been called at the time of injury had told him; he was very familiar with anatomical terms, and he believed he had a rupture. The history of the case, together with treatment prescribed, led me to think there was no rupture. Physical examination confirmed my belief. The man was

a stone cutter out of employment at his trade, and went into a mill for the winter. He feigned in order to avoid such work. Another case was a man who hurt his foot; several X-ray plates showed no deformity; there was a verbal interrogation of two competent physicians who took care of the case and thought he was shamming. Saw same person coming out of saloon and he walked first rate. He complained he could not carry a bunch of shingles up a ladder. History showed he worked at a bench and did not have to carry shingles. I think every case is an individual equation in itself, and a thorough examination of all associated circumstances is necessary before a logical conclusion can be drawn.

L. G. Beeley, M.D.—In general, the suspicion of malingering is present where the patient bases his complaint on pain and weakness—subjective symptoms—at times seemingly out of proportion to the appearance of the parts. As regards pain the question is one of difficult consideration. It is notoriously true that there is the widest range of response to pain between different individuals. A final estimate of the suffering endured is the result of weighing a large number of factors, viz.:—

1. The general mental type of injured.
 - (a) Whether he finds unreasonable fault with the way he is being used by employer and insurance company.
 - (b) Whether he is willing to try to resume work, and if not, the particular reason for refusal.
2. The appearance of the particular parts in question as to —
 - (a) Stiffness on manipulation.
 - (b) Amount of strain placed on parts during function.
 - (c) Inflammation: pain, redness and swelling.
 - (d) Adherent scars.
 - (e) Local nutritional disturbances.
3. Type and distribution of pain, in view of type of injury.
4. Effect of pain on sleep, eating and pleasure.
5. Manner in which affected part is carried and used when attention is directed away from same.
6. Whether any effort is being made to restore function.
7. Malingeringers may affect a coarse tremor when only slight strength is exerted.

Weakness is seriously questioned when, after due allowance is made for disuse —

1. There is a lack of correlation between the strength exerted and size of muscles used in the function.
2. A muscle group will be used for one purpose strongly, and a similar one weakly (there being no other modifying factors).
3. When tendons and joints are not tied down by scars.

F. A. Donaldson, M.D. — The only case of what I considered malinger-
ing which I have had was that of a young man claiming constant
pain in an inguinal hernia when standing, so that he could not work,
this lasting months. He said the hernia was due to a blow, which he
described. Such a hernia is so rarely caused by a blow that it almost
may be said to never occur. It was small, reducible and was not, ap-
parently, abnormally tender. Therefore, since I doubted the cause
assigned, because of size, reducibility, unusualness of constant pain,
absence of signs of pain on coughing when his attention was diverted,
I believed that he was malingering.

Daniel J. Fennelly, M.D. — I have had only one actual case of con-
scious malingering or feigning incapacity for work. In all simulated
diseases detection depends on (a) the incongruity and lack of proper
sequence in the symptoms presented; (b) the presence of a motive for
simulation; and (c) the patient's actions and the course of his ailment
when under close observation and control.

W. P. Bowers, M.D. — I have not observed any malingering on the
part of the people coming under the provisions of the law relating to
industrial accidents.

Thomas F. Leen, M.D. — In the 40 cases I examined for your Board
I don't recall one case of malingering, and I believe this statement will
be corroborated by an examination of my reports.

Jeremiah Crowley, M.D. — I have had no cases of conscious malin-
gering during the past year.

P. H. O'Connor, M.D. — I have never met with any such cases nor
seen any that I regarded with much suspicion.

John T. Duggan, M.D. — I am not conscious of any cases of malin-
gering, as I believe in all my examinations the answers of the claimants
were true and full.

Henry J. Keaney, M.D. — I have not had any cases of conscious
malinger-
ing.

WORKMEN AND MALINGERING IN MASSACHUSETTS.

Legislation conferring benefits upon workmen in the event of injuries arising out of their employment has considerably affected the incidence of malingering, and to-day the workman is included among those whom it is not unusual to find feigning incapacity for work. Before the advent of such legislation malingering among workmen was negligible. Simulation of disease or injury was practiced principally by soldiers and sailors wishing to evade duty, inmates of correctional and penal institutions unwilling to perform the tasks assigned them, and young men in foreign countries anxious to escape military service. The toiler had nothing to gain through such practice. If incapacitated by illness or injury he was not assured of any assistance, and necessity usually compelled him to return to work while still a sufferer. Social legislation provided him the incentive to gain through feigned incapacity for work, and soon afterward he ceased to be a nonentity as a malingerer.

How to deal with the malingering workman has become a difficult problem in some foreign countries, especially in England, where it is alleged the practice of simulation by workmen has resulted in excessive drains upon insurance and compensation funds.

Happily, no such condition has thus far attended the operation of the Workmen's Compensation Act in Massachusetts. Malingering by the industrial workers of this State is inconsequential. The Industrial Accident Board has carefully guarded against this evil, which saps the strength of industry, works harm to the morals of employees, results in a high cost of insurance to employers, and in general imposes an unnecessary burden upon the community. It is fully realized that simulation in its various forms must be carefully watched for and promptly and effectively checked if the rights of the parties under the act are to be fully safeguarded.

It is generally agreed that malingering should be considered to mean not only the deliberate perpetration of fraud for per-

sonal gain, but also undue prolongation of illness, unwillingness to return to work and the exaggeration of symptoms. Sir John Collie, a noted authority on nervous disorders, in his book on "Malingering," says:—

It is a mistake to think that all malingering is the outcome of deliberate wickedness. Because a man does not return to work as soon as one thinks he ought, it is harsh to assume that he is a shammer, and should be branded as a wilful malingerer. Such a view is not only unjust, but demonstrates a poor knowledge of human nature. Great allowance has to be made for the personal equation. Moral responsibility, even amongst the highly educated, is a variable quantity; indeed, it varies almost as much with different individuals as do the features. We cannot always fully appreciate the mental processes taking place in each individual mind, and, as long as unregenerate human nature is being dealt with, so long are we bound to weigh all the circumstances of each case. The mental attitude of workmen after sickness is a very complicated one, and it is only by studying and fully understanding it that such cases can be successfully dealt with.

Among workmen in Massachusetts the deliberate simulation of injury with intent to defraud is rare, but the practice of malingering in its other forms is not uncommon. Occasionally a case arises where it is difficult to determine whether the injured employee is a conscious deceiver, a sufferer from traumatic neurasthenia or a traumatic neurosis or the victim of psychological conditions resulting from an accident.

The deliberate faker usually arouses suspicion of his true character by a disingenuous bearing and an incomplete story, and if, upon investigation, the suspicion is verified, his case is summarily closed. A regrettable fact is that in the few such cases which occur the workman is seldom alone in his attempted deception; he is too often the misguided victim of unscrupulous professional advisers or persons with abnormal desires to debase others. Such individuals apparently do not appreciate the fact that they incur risks of conflict with the criminal laws relating to perjury, subornation and obtaining money under false pretenses.

The experience of the Board has been chiefly with the exceptional cases of malingering workmen for whose existence specious reasons may be advanced. Injured workmen, like the

majority of sick or injured persons, are sometimes likely to magnify their condition. Occasionally a workman is found to be a victim of autosuggestion, unconsciously exaggerating his incapacity for work. He then will refuse persistently to attempt to work while suffering any degree of pain or stiffness; shows lack of appreciation that complete recovery from the effects of an injury is a gradual process; unduly prolongs his period of incapacity by neglecting to subject his injured part to prescribed movements and exercises. Some workmen, particularly the alien, unfamiliar with the customs and procedure of this country, and fearful of losing both employment and compensation, become apprehensive lest the genuine results of injury may be minimized, or overanxious to guard against the contingency of future incapacity resulting from the injury, and consciously or unconsciously exaggerate their ailments.

The indolent workman, the inefficient workman, who correctly estimates his own incapability; the mentally deficient workman lacking initiative and ambition; and the workman whose regular employment is dull and who does not wish to engage in any other work as a rule manifest unwillingness to return to work after the period of incapacity due to injury has ended.

In passing, a word should be said about the temptations to defer his return to work to which some workmen are exposed. The existence of the ordinary worker in industry is but commonplace, and it is not strange that he should yield to the temptation to enjoy a brief respite from toil if injured. The temptation is greater if he is a member of one or more fraternal organizations which pay a weekly benefit to members during incapacity for work. A few cases have come to the attention of the Board where injured workmen have received, during incapacity, compensation payments and weekly benefits from fraternal organizations aggregating each week greater sums than their weekly wages.

Invaluable aid toward the detection of malingering is rendered the Board by impartial physicians appointed under the provisions of section 8, Part III. of the Workmen's Compensation Act. Attempts of the conscious deceiver to match his

natural cunning against the science and skill of the medical examiner seldom prove successful, and in the exceptional cases the attempted deception is usually revealed through investigations by inspectors of the Board or evidence adduced at hearings of arbitration committees appointed under provisions of sections 5 and 6, Part III., and reviews of cases by the Board. Every experienced physician is familiar with unconscious exaggeration of incapacity.

A study of 1,000 impartial reports filed from July 1, 1913, to June 30, 1914, shows but 5 cases where workmen claiming compensation were unequivocally charged with malingering, while in 135 cases they were reported able to perform some work. In the remaining 769 cases they were reported unable to perform any work. These reports are not conclusive in doubtful cases which come before the Board. There is always reserved to the claimant the right to produce witnesses at a hearing by an arbitration committee or a review by the Board to refute, if possible, the allegations of the impartial physician, and every endeavor is made to justly differentiate between the malingerer and the workman who is unable to work.

A case on file with the Board, giving the opinion of an impartial physician, is as follows:—

The employee, a youth nineteen years old, had his left leg, left forearm and left side injured in an elevator accident. He walked home, but had a physician attend him for two weeks. Three weeks after the date of injury he was examined by an impartial physician.

Opinion.—“He is able to work, and in plain language is a malingerer.”

The following is another case:—

The employee, a laborer thirty-six years old, fell from a lumber pile, striking a wagon in his descent, and fracturing the ninth rib on his right side. He was given medical treatment for four weeks, after which medical treatment was not considered necessary. He remained out of work for four months after the date of injury, and was still claiming incapacity for work when sent to an impartial physician.

Opinion.—“This man is a malingerer and could go to work any time. The sooner he goes to work the better it will be for him.”

An ear specialist contributed the opinion in the following case: —

The employee, a carpenter's helper forty-three years old, was struck on the right ear by a falling board. He remained out of work for five weeks, alleging incapacity was due to deafness. He was sent to an impartial physician.

Opinion. — "I consider his claim of marked deafness a case of malingering."

In the following case the impartial physician was unable to determine whether the workman was a malingerer: —

The employee, a calender backtender in a paper mill, had the tips of the middle and ring fingers of his right hand crushed between calender rolls. He still claimed incapacity for work at the expiration of one year, during which time he was paid compensation. He was examined by an impartial physician.

Opinion. — "This patient is either a malingerer or is suffering from traumatic neurosis."

Diagnosis and opinion of the impartial physician in the following case show how lack of occupation sometimes affects an injured workman: —

The employee, a machinist forty-eight years old, was struck on the head by a heavy wrench which fell from the top of a building. He was knocked down, but did not become unconscious. He went to a physician's office where his injuries were found to be two cuts, very deep and swollen. No stitches were taken.

Five months later he was examined by an impartial physician as he still claimed incapacity for work.

Diagnosis. — "On his statement, and in view of the examination, and considering the other examinations that have been made, there seems to be a large amount of introspection and dwelling upon his symptoms — exaggerating their importance in his own mind. While there is much that suggests exaggeration, I am unwilling to say that it is a pure case of malingering, but it appears to be a case of nervous exhaustion, due more to the lack of occupation and his habit of dwelling upon himself to the point of exaggeration and to an apparent belief that there is something seriously wrong with his head. He has a marked degree of arterial change for a man of his age, and that is an additional factor which tends to prolong his difficulty. I believe that

the best prospect for this man returning to work would be to give him a fixed sum, or to state a fixed date beyond which time compensation would not be paid, which might act as a mental brace, to get him to make the effort which is now lacking."

The injured workman in the following case showed no disposition to help himself by exercising his injured part.

A carpenter had the tip of the second finger of his right hand cut off and the third finger of the same hand scratched. Three months later he was still drawing compensation and claimed inability to work. He was sent to an impartial physician.

Opinion.—"In the opinion of the subscriber the main disability consists in the loss of the tip of the second finger of the right hand; a slight thickening of the whole finger, and as a result of this thickening (hypertrophy) a slight impairment of the motion of flexion. The thickening of the finger will, I believe, disappear in time. The finger will be benefited by massage or movements. Even the use of tools, such as grasping, is good for it. Inasmuch as there is no impairment in the other finger of his right hand, or of the hand itself, or of the arm, and inasmuch as the amount of flexion that he has in the injured finger (second finger) is sufficient for the grasping of all kinds of tools used by a carpenter; and inasmuch as movements of the hand and finger instead of harming will benefit his finger, I am of the opinion that this man is not incapacitated for his work."

In the following case the workman was discovered to be a victim of a pre-existent disease.

The employee, a furniture and piano mover fifty-two years old, was injured by a runaway horse, and was incapacitated for work for two weeks. Ten weeks later, while going downstairs, his knees gave out. He went to a hospital where he was found to be suffering from locomotor ataxia due to infection thirty years previously.

Opinion.—"His present condition has no relation to the accident."

It has been proposed in England that there be established some system of registration which shall make apparent what is the full amount of benefits, if any, received by persons incapacitated by sickness and accident and entitled to payments from insurance and compensation funds. The success of such a system, if established, will undoubtedly be watched with interest by other countries.

A greater personal interest by employers in their injured employees would be helpful in checking any tendency towards malingering. By encouraging their injured workmen to return to work, bestowing upon them the meed of sympathy to which they are justly entitled, and providing such unfortunates with light work until they can resume their regular work, employers will not only aid in the prevention of malingering but will save considerable loss to themselves and render a service to the State.

The Board makes every possible effort to expedite the settlement of disputed cases, realizing that delay in hearings has an influence upon malingering, as a workman awaiting the disposition of his case may possibly magnify his condition, and, although physically able to resume work, may lack sufficient stimulus to do so.

In the light of the experience of foreign countries with malingering workmen it is particularly gratifying to find that the practice is almost infinitesimal in this Commonwealth, and the existence of such a pleasing condition is largely attributable to the co-operation of those whose interest in the welfare of the State is more than passive.

Organized labor, viewing malingering among workers as a practice in contravention to the principles of its fraternity, is prominent in the movement to repress effectually an evil which would become detrimental to industry, enable the unworthy to receive benefits intended purely for the worthy, and tend to retard the further extension of the compensation program.

The policy of the Board as a whole discredits any attempt at malingering. Its power to order an impartial examination at any time is one of the most effective means of repressing any tendency towards this grave evil. If an employee is offered work which the incapacity due to the injury will not prevent him from performing, and he declines to attempt to perform such work, he is notified promptly that, should his refusal prove to be unreasonable, his rights to benefits under the statute would be seriously prejudiced. The family physician, by telling the truth in regard to the incapacity for work, or lack of such incapacity, of an employee; the physician engaged by

the insurer, by realizing that he can best serve his employer by making a fair statement of conditions found upon examination; employers, by encouraging injured workmen to resume employment, and making it possible for them, by the removal of any unnecessary restrictions, to perform the work provided; and employees themselves, by returning to wage-earning labor without needless delay, — all can aid the Board further in making impossible in this country conditions which have become prevalent in Europe and made conscious malingering a serious menace to further extensions of the great benefits of workmen's compensation.

INVESTIGATIONS AND INSPECTIONS.

This department was established during the past year. It consists of six inspectors — one woman and five men — appointed from the list of eligibles certified by the Civil Service Commission after special examination. Their terms began Jan. 8, 1914; consequently, the following report of the work of this department covers a little less than eleven months. Though nominally designated as the inspection department, it is, in reality, a department of inspection and investigation combined. Its activities have covered a wide range, and matters involving nearly every feature of the workmen's compensation law have been referred to it for investigation of the facts for guidance in the equitable settlement of claims. This feature has proved a very important and necessary part of the work of this department, and has taken the inspecting force to every part of the State. Since its establishment this department has made 3,157 investigations. Among matters investigated were circumstances and facts of particular accidents necessary to determine whether they occurred out of and in the course of employment, whether either the employer or the employee was guilty of serious and willful misconduct, the extent and duration of disability, both total and partial, the average weekly rate of wages of the injured employee on which his compensation should be based, the extent and reasonableness of medical and hospital services rendered, and, in fatal cases, the facts relating to dependency, who were the dependents, and the extent of their dependency.

Under the provisions of the compensation act all lump sum settlements must be approved by the Accident Board. These cases are first referred to this department for investigation of the facts for the guidance of the Board in determining the advisability of such settlement in each case.

An important feature of the work has been the dissemination among employers and employees of information relative to the provisions and workings of the workmen's compensation law. In the furtherance of this work, in addition to information

daily given in the course of field work, forty-one especially advertised meetings have been held by the inspectors in the principal industrial centers of the State.

Another important function of the inspection department is accident prevention. By the provisions of chapter 813, Acts of 1913, the Industrial Accident Board is authorized to carry on inspection and investigation of the causes of injuries for which compensation may be claimed. Personal injury as defined by the Massachusetts Supreme Judicial Court in the case of *Johnson v. The London Guarantee and Accident Co., Ltd.*, is "any injury or disease which arises out of and in the course of the employment which causes incapacity for work and thereby impairs the ability of the employee for earning wages." The work in this field presents a wide scope of research by the inspection department which has endeavored to meet the problems presented in a practical manner. It has been found to be highly essential to ascertain the frequency of accidents under different conditions in the various industries, and also to prepare other statistical data to serve as a guide to the inspectors in their investigations and inspections. In pursuance of this policy this department has, in addition to its field work, prepared from the employers' reports of accidents filed with the Board comparative studies in the plants inspected relative to the causes of accidents, duration of disability, compensation paid and wages lost. These studies have proved of great value as aids in seeking out the dangerous conditions existing in individual plants. Special comparative statistics of accidents to women, their frequency in different occupations, and their relative number as compared with injuries to men have also been prepared by the department.

During the period of eleven months covered by this report, the Board's inspectors have investigated the causes of injuries in places of employment in various parts of the Commonwealth, covering plants which employ one-eighth of all the employees protected by the Workmen's Compensation Act, and making recommendations which will aid in reducing to the minimum the number of preventable injuries. In all, 145 industrial establishments, employing 110,000 employees, were inspected. These plants are among the very largest in the State, and a

copy of the inspector's report and recommendations have been sent to each employer. The replies received indicate that this feature of the work is meeting with general co-operation on the part of the employers of the State. In this line of safety work it has been the aim to meet the problems of safeguarding machinery in a practical manner.

The analysis of the causes of injuries to employees shows that the largest percentage is not directly due to machinery, but to other causes in which the human element is the controlling factor. It is evident that the only effective means of lessening the number of this largest of all classes of accidents is through a systematic educational campaign, with a view to cultivating habits of caution in the workers and better conditions of safety on the part of the employers. This can be brought about only through co-operation between employer and employee. The inspection department, with the experience acquired through its work in the field and statistical data compiled at the office, has assisted the Board in the elaboration of plans for safety organization on the part of the employers and employees throughout the State as outlined in Bulletin No. 9 issued September, 1914; and a very important feature of the duties of the inspection department is the furtherance of this line of work throughout the State, both by advice and by assistance wherever desired. This work is as yet in its initiatory stages, but it is confidently believed that it will eventually result in a great permanent reduction in the number of accidents.

A GALLERY OF INJURED EMPLOYEES.

Owing to the interest and value attached to the gallery printed in the first annual report, the Board has deemed it advisable to show a few pictures of cases which occurred in the second year of the act. The effort has been made to avoid duplication in the cases selected, and to show a few pictures which will represent different conditions under which accidents happened, and the lessons to be learned from each case.

In considering these cases the fact should be borne in mind that accidents can be reduced by the installation of safety devices to a certain extent only. In addition there is needed a vigorous and constant campaign of safety education and organization work. Merely to install mechanical safeguards by no means solves the problem of accident prevention. Safety organization in which the employees actually recommend devices, and have an active hand in formulating policies, is absolutely necessary if anything is to be accomplished in the way of cutting down the terrible waste of human loss and suffering. Only in this manner will it be possible to obtain any appreciable and ultimate reduction in the cost of insurance paid for by employers of labor. We hear a great deal concerning the increase in the State tax and the burdens placed upon industry by various kinds of social legislation. There has been going on for years, however, an intangible and indirect form of tax levy which has only recently been recognized in this country by persons alive to the necessity for reducing all kinds of waste. One of the heaviest forms of taxation levied on a community is the economic loss occasioned by industrial injuries. Highly specialized forms of industrial organization, scientific accounting, personal efficiency, the utilization of by-products, and the very important developments in production processes are generally becoming recognized. The persons and concerns who apply these principles are also the ones who have accomplished most in the reduction of accidents by safety organizations and by the installation of safety appliances. The actual money expenditure necessary for proper safety organization

is entirely negligible when compared with the saving certain to follow as a result of reduction-in-accidents management.

Waiving entirely the humane aspects of the question, safety management as a pure business proposition will save money not only by reason of the reduced premium costs certain to follow when the results begin to show, but also by the great saving which will be made in the present economic loss. This is not a visionary theory, but an incontrovertible fact, which can be proved by the experience of concerns which have adopted the policy, and who can show, as a result, an enormous saving. These results can be accomplished by all if the policy is inaugurated and then constantly developed and applied.

The photographs shown in the following pages represent a few cases in which either a proper safeguard or proper education of employees would have tended to prevent these regrettable injuries. As previously stated no attempt has been made in these illustrations to cover the field entirely, but the idea has been, rather, to amplify the gallery shown in the first annual report. Later, when there is a sufficiently large collection available, there probably will be issued a special bulletin in which the entire gallery will be brought together.



No. 9747 B. — Lineman receives Serious Injury.

PARTIAL LOSS OF VISION, USE OF LEFT ARM AND DISFIGUREMENT TO FACE THE
RESULT.

This employee, while at work on a pole teeing in wire, slipped, striking the left side of his face against a primary wire, and his left wrist against another, resulting in serious burns which disfigured his face and necessitated the amputation of his arm below the elbow. He was working at such a height that the injury might have proved fatal had he not been lowered to the ground.

This injury strikingly illustrates the need of a lineman's shield in every case where contact with live wires is likely, and the necessity of wearing rubber gloves which extend over the wrists of the workmen. Whenever the nature of the lineman's work will permit, rubbers should also be worn. By strict adherence to these precautions many similar injuries could be avoided.

The specific and total disability compensation provided by the act was paid in this case by the Aetna Life Insurance Company, the insurer.



No. 63349 B. — Frozen Hands.

COAL-TRIMMER EXPOSED TO ELEMENTS.

This employee was a victim of the freezing weather of December, 1914. His work as a coal-trimmer at the wharves exposed him to the bitter cold, and he was not equipped with proper gloves. Both hands were frozen, necessitating amputation of eight fingers.

Proper working wearing apparel, always an absolute necessity in similar work, and under similar weather conditions, would, in all probability, have prevented this accident.

The Employers Liability Assurance Corporation, Ltd., was the insurer.



No. 53672 B. — The Work of a Circular Saw.

SAWYER RECEIVED PERMANENTLY DISABLING INJURIES.

This employee, a boy of nineteen years, worked as a sawyer in a portable saw-mill owned by his father. While standing on a wooden platform sawing dry pine logs in a 52-inch circular saw, he placed his right hand against the smooth surface of the saw to see whether or not it was overheated. His hand was drawn in between the side of the saw and a board on top of the saw-frame, and held fast. In an effort to release his hand he slipped to the floor of the platform, and fell upon the revolving saw, sustaining permanently disabling injuries to his upper left arm and back.

The installation of practical safety devices is the only efficient method of lessening the injuries incidental to this kind of employment.

The use of rubber mats or strips, which are safeguards against slipping upon floors of platforms, might have saved this employee from serious injury.

Compensation on account of total disability, to which this employee was entitled under the provisions of the act, was paid by the Employers Liability Assurance Corporation, Ltd.



No. 8682 C. — Hand caught in Power-shear.

OPERATOR LOSES FINGERS THROUGH INJURY.

While engaged at his regular employment as a power-shear operator this employee neglected to use the metal strip or templet provided. His fingers were caught under the descending blade of the machine and were severed as shown.

This injury indicates the importance of safeguarding machinery and placing the safety-control device within easy reach of the operator. Many effective appliances may be devised to protect employees from this type of machinery. In connection with this injury the point is also illustrated that not only should safeguards be provided, but employees should be educated and compelled to use the guards.

Compensation on account of incapacity for work, and specific compensation on account of the loss of the fingers, has been paid in this case by the Fidelity and Deposit Company, the insurer.



No. 70834 B. — Severe Electrical Burns cause Disability.

WHILE ERECTING TEMPORARY PARTITION, RULE WHICH EMPLOYEE HAD IN HAND
CAME IN CONTACT WITH LIVE WIRE CABLES.

This employee, a carpenter, was engaged in making measurements on temporary partitions, when the rule which he held in hand came in contact with high voltage electric wire cables, his head at the same time brushing against an iron beam, making a ground for the current. Injuries resulted which necessitated the amputation of his hand above the wrist, and the insertion of a silver plate in his skull.

Proper signals — "Danger," "Don't touch," etc. — at the point of danger would have warned the workman of his danger, and in all probability have prevented the accident.

The Employers Liability Assurance Corporation, Ltd., paid the employee the additional compensation provided for the loss of a hand, in addition to the maximum compensation on account of incapacity for work, as a result of the injury.



No. 32734 B. — Boy receives Serious Injury.

INEXPERIENCED EMPLOYEE RECEIVES PERMANENT DISABLING INJURY.

This employee, an inexperienced foreigner, was picking cotton from back of lap, while the machine was in motion. His fingers were caught underneath, between the lap and the calender roll, the result, as shown in the illustration, being substantially the loss of the use of the hand. He was employed as a double-tender in a yarn mill, and received a weekly wage of \$6.35.

Injuries under such circumstances, generally due to inexperience and lack of knowledge in the use and operation of machinery, occur frequently. Instructions when given should be fully and thoroughly understood by the operator. The use of an interpreter who could properly convey the instructions is always advisable, unless the instructor himself speaks the language of the learner.

“Things not to do” should be pointed out, and rigid discipline enforced.

The specific and total disability compensation provided by the act has been paid by the Employers Liability Assurance Corporation, Ltd., the insurer in this case.



No. 59792 B. — Piano Worker injured.

BLOOD POISONING FOLLOWS SCRATCH ON HAND.

This employee suffered the loss of a part of the thumb and little finger of his left hand as a result of blood poisoning following a scratch which he received while employed as a "piano rubber." The impartial physician states that in his opinion "he has a hand which is permanently incapable of use."

Injuries of this character may be avoided by the exercise of great care in the use of the oils, dusts, etc., incidental to the employment of a "piano rubber," and no injury should be considered in the category of those which are too trivial to receive first aid or proper medical attention, as the case may require.

The Standard Accident Insurance Company was the insurer, and has paid the compensation due in accordance with the provisions of the act.



No. 26196 B. — Arm caught in Gear.

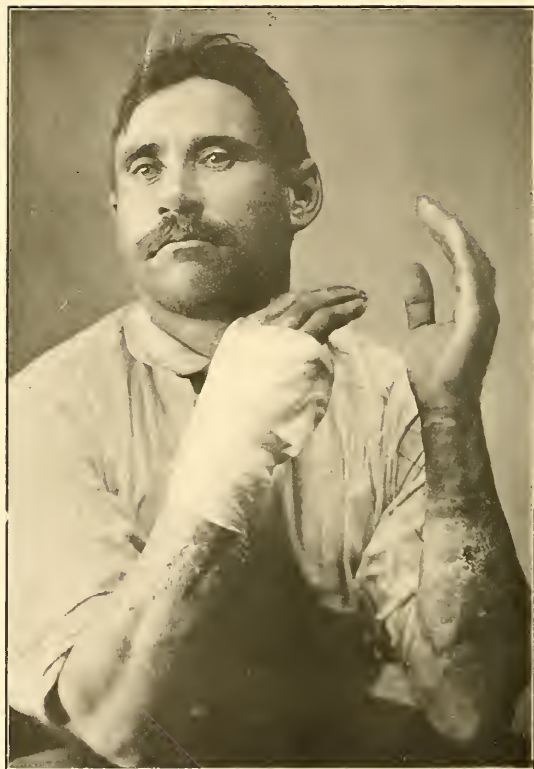
SEVERE INJURY RECEIVED WHILE REMOVING WASTE FROM SHAFT OF DOUBLER.

This inexperienced workman was injured while removing a lap of waste from around the shaft under the head of a doubler by reason of getting his arm caught in a gear.

As a result of the accident he suffered two fractures of the right arm, a severe crushing of the elbow, and multiple bruises and lacerations of the arm.

This type of injury illustrates the importance of thoroughly guarding gears, and also the importance of instructing inexperienced and ignorant employees of the dangers to be avoided in working around machinery. This particular employee was a low-paid man, and has a real permanent disability. His average weekly wages at the time of his injury were \$6.75, and after a year's total disability he was given work by his former employer at a wage of \$5.40. The injury is such that this man is prevented from ever advancing to any considerable extent, and if the employer should in the future be unable to keep him employed he is severely handicapped in finding work which he can do.

The insurer in this case is the Employers Liability Assurance Corporation, Ltd. All compensation in accordance with the law has been paid.



No. 90408 B. — Building Wrecker seriously injured.

BOTH HANDS AND ARMS SEVERELY BURNED.

While lighting gasoline torches with matches instead of tapers the gasoline-soaked cotton gloves which this employee wore became ignited, and he suffered severe burns of both hands and arms. An operation for the grafting of new skin, and two operations for the purpose of loosening the skin on the right thumb for the purpose of getting better flexion, kept him in the hospital for a period of eight weeks.

The use of a long wax taper might have enabled this employee to be out of the range of the flames, and thus prevented the injury.

The compensation provided by the act has been paid in this case by the Employers Liability Assurance Corporation, Ltd., the insurer.



No. 48662 B. — Pile driver loses Sight of Eye.

INJURY RESULTS FROM STRAIN.

The employee, a pile driver by occupation, was assisting to carry a heavy pile to a point where it could be handled by the machine. While doing this he felt something snap in his eye, and then gradually he lost complete vision in his left eye. At the time of this injury the employee was already blind in the other eye. The probability is that the employee will be totally blind while he lives. The precise injury to the employee's left eye was occasioned by separation of the retina, a condition which eye experts agree is usually to be ascribed to some exciting cause such as a strain.

This employee was unfortunate in being blind in one eye at the time of the injury to his good eye. Although this particular injury could not be foreseen, the principle holds true that in general all heavy material should be moved wherever possible by some other power than hand labor. A good many cases of strain can be eliminated by giving workmen mechanical assistance when handling heavy material.

The insurer in this case is the Fidelity and Casualty Company of New York. The employee has been paid compensation for total disability, and in addition has received compensation for the loss of sight in one eye.

THE SINS OF OMISSION BY EMPLOYERS OF LABOR.

By reason of their sins of omission, the employers of this State are annually losing an opportunity to save an average of \$20 per reported injury.

On the basis of 90,000 injuries per year this means, in round numbers, that the cost of such sins of omission to all the employers of the State is about \$1,800,000 in insurance premiums.

In addition to this we must add the cost of the loss of experienced workmen from employment annually for a total of about 1,200,000 working days. This cost cannot fully be estimated. The actual wage loss to employees was nearly \$3,000,000, and the estimated economic loss to the employer totals at least another \$3,000,000.

The sins of omission referred to above are the neglect of employers to take advantage of the movement to organize committees of safety, to guard well-known danger points, to make dangerous conditions in their plants safe, and to place at the disposal of their employees the simple sanitary devices which make for their general health and welfare, improve their working efficiency, and reduce to the minimum the number of personal injuries which arise out of and in the course of their employment.

It is well recognized throughout the world that at least 50 per cent. of all injuries to employees can be prevented by the adoption of necessary and simple safeguards, the organizing of committees of safety in the places in which such employees work, and a campaign of education along safety lines.

The average cost of insurance per injured employee in this State, as shown by the Board's statistics, is about \$40 per annum. It is a simple problem in arithmetic to demonstrate that if 50 per cent. of these injuries can be prevented, one-half of that sum may eventually be saved, that is, \$20 per injured employee.

We urge upon all employers the wisdom of active efforts for the removal of the criminal waste occasioned by their failure

to co-operate with the Board in this great work, such failure having occasioned in two years the unnecessary payment of \$3,600,000 in compensation, a needless wage loss of \$3,000,000, and a wasteful economic loss of at least the same figure, making in all the alarming total of \$9,600,000 as the cost of the sins of omission by employers of labor for a period of only two years.

ACCIDENT PREVENTION IN INDUSTRIES.

Reference to the statistical tables of the first annual report of the Industrial Accident Board shows that during the first year there were 89,694 non-fatal and 474 fatal accidents reported to the Board. The second annual report shows a total of 96,382 non-fatal and 509 fatal accidents during the second year of the act.

The average amount paid in compensation benefits for each case reported was \$18.70 for the first year and for the second year.

After two years of extensive and classified study the Board has come to the conclusion that at least 40 per cent. of the accidents arising out of and in the course of employment in this Commonwealth may be avoided and prevented.

The prevention of accidents may be brought about by the installation of safety devices, the safeguarding of dangerous points, improved lighting, orderly arrangement of machinery and equipment, proper instructions to operators, and by the exercise of due care on the part of employees.

In order to apply the most effective means of preventing accidents, the sources or causes of the same must first be found, and an analysis of the many thousands of accidents reported during the first two years of the operation of the act shows the eventual benefits to be derived from the organization of safety and accident prevention committees which are being indorsed by the Board.

The results attained by employers who have introduced efficient safety devices and organized safety committees in their plants show that this is the only practical solution of this great problem.

The following tabulated data show, in a most striking manner, just what one company, the Boston & Maine Railroad, accomplished by the introduction of a "safety-first" movement:—

Fatal Accidents to Employees.

	January.	February.	March.	April.	May.	June.	Total.
1912,	7	9	7	5	3	2	33
1913,	7	12	9	3	5	2	38
1914,	3	6	2	4	2	3	20

Serious Accidents to Employees (Loss of Arm, Leg or Eye).

	January.	February.	March.	April.	May.	June.	Total.
1912,	1	4	—	2	2	—	9
1913,	1	1	2	3	—	—	7
1914,	—	—	1	—	—	1	2

Decrease in fatal accidents, 1913-14, 46 per cent.
 Decrease in serious accidents, 1913-14, 71 per cent.

This record shows six months of “safety-first” compared with the corresponding six months of 1912-13.

A study of the accident record of an employer, covering a period of one year, constitutes a barometer which shows the attitude of the employer in relation to accident prevention and safety.

An employer, having approximately 2,000 employees on his pay roll, shows an accident record of 47 accidents during one year; while another employer in the same line of industry, but employing approximately 2,500 employees, shows an accident record of 99 accidents during one year, — a difference of 52 accidents for an increase of 500 in the number of employees. An inspection of both plants showed sufficient cause for the difference, the former plant being equipped with effective and efficient safety organization. This organization included a workmen’s safety committee, composed of five men chosen among the employees to serve for one month. In the latter plant no safety organization had been established, and inspection showed ample room for improvement. It also developed that in this plant, during a one-year period, there had been five cases of septic poisoning, resulting from neglected injuries; that is, injuries which were apparently trivial and thus were not

given proper attention. In the former plant there had not been one case of septic poisoning from neglected injuries during the same period. It is fair to assume that this was the result of safety organization and a general knowledge among the employees that all injuries, however slight, should be properly attended to. Many of the employers throughout the Commonwealth have become interested in safety organization, and have undertaken the great task of accident prevention through its means; but that too few employers have become acquainted with its benefits is evidenced by the number of accidents occurring daily.

No effort is spared by the employers of the Commonwealth to protect their property from fire loss and reduce the fire hazard by the introduction of sprinkler systems, fire extinguishers, lines of fire hose placed at various locations through their factories, etc., and many maintain a permanent fire-fighting brigade. Well-organized and disciplined forces are the result.

What are the results of these precautionary steps? Lessening of fire risk and a decrease in insurance premiums. Inasmuch as the protection of property has been accomplished through the introduction and installation of these safeguards, is it not fair to assume that the protection of life, and incidentally the lessening of industrial accidents, may be brought about by the installation of safeguards and the introduction of safety committees and organizations into the industries of the Commonwealth?

The health and life of the workman in industry should be guarded, and safety organization will bring this about. The absence of proper safeguards has resulted in many serious and fatal accidents, and employers of labor will admit that a few, at least, of those numbered among the many could and would have been prevented by a safety device, safeguard or more thorough and proper instruction to inexperienced operators.

Much can be accomplished without adding to the fixed charges of any manufacturer, since very thorough and efficient safety organization may be formed from among the working force of any plant, and besides the suffering, loss of time, and

sometimes loss of wage which the employee is spared, the employer is saved the services of a trained employee in many instances, and material which might be destroyed by the employment of an inexperienced workman.

In the belief that at least 40 per cent. of the accidents occurring in Massachusetts during the past year can be eliminated, the Industrial Accident Board solicits the co-operation of employers and employees in the movement to prevent the same.

A special study of the accident statistics of manufacturers who have been pioneers in the "accident prevention" or "safety-first" movement verifies the opinion that accident prevention pays from an economic standpoint. Considered from its humane side, it is universally agreed that it has justified the investment of every dollar and the expenditure of every energy made to the end that the wage earner be spared misery and suffering and be kept in industry for his family.

In September, 1914, Special Bulletin No. 9 was issued by the Industrial Accident Board. This bulletin is "An Invitation to the Employers of Massachusetts to organize for Safety, and an Offer of Assistance by the Industrial Accident Board."

Copies of this bulletin were mailed to the employers of labor in the State, calling their attention to the importance of placing safety and accident prevention on an established and permanent basis.

Among the manufacturers who have made progress along this line are the following: the American Steel and Wire Company of Worcester; the General Electric Company of Lynn and Pittsfield; the Norton Company of Worcester; the Dennison Manufacturing Company of South Framingham; the United Shoe Machinery Company of Beverly; and many others who have more recently taken up the work. The Boston & Maine Railroad has had a very effective safety-first organization in operation during the past year.

The accident statistics of the above-mentioned companies show a material reduction in the number of accidents, and this is traceable to their efficient permanent safety organizations. Their experience may be duplicated — perhaps surpassed, depending upon the nature of the business — by other manufacturers of the Commonwealth.

The method of procedure in the organization of an accident prevention department has been outlined by the Board in the bulletin previously referred to, and where active participation by the Board is desired in the work of formation service and assistance will be rendered.

The work of safety organization should show a material increase during the coming year, especially among manufacturers who have in their employ hundreds of employees, men and women.

Safety organization will accomplish a wonderful amount of good for the manufacturer who has made little advancement in the installation of safety devices, and will do no less effective work in the plant which has been thoroughly safeguarded.

Effective lighting tends towards orderliness, cleanliness and safety. Education and instruction, resulting from the introduction of the workmen's safety committees, will have a telling effect on carelessness and untidiness and the violation of existing rules, — all tending to eliminate many accidents.

SAFETY DEVICES IN ACCIDENT PREVENTION.

The introduction of effective safety devices or safeguards into the factories of the State has supplied an important feature in accident prevention, materially lessening the number of accidents.

The proper time to introduce safeguards on machines is during the process of their construction, and makers of machinery are now competing in this direction. In the past, machines have been constructed without due regard to the safety or protection of the operator. The enactment of the Workmen's Compensation Act and the spread of the "safety-first" movement have played an important part in bringing about this change, as well as the fact that purchasers of machinery see the advantages of having the same properly guarded, and in their specifications have called for machines with all dangerous parts well guarded.

Safeguarding is rightfully a matter of design, and the mechanic who neglects to incorporate this necessity will find himself liable to criticism. Every draft of a machine should show

the danger point to be remedied before being turned over to the mechanical department. The following — a few of the foremost machine makers of Massachusetts — have made great improvements in this respect: the Reed-Prentice Company, the Whitin Machine Company, the Rice & Barton Company and the General Electric Company, etc.

The machines lately built by these concerns have made safeguarding a special feature, and a recent order placed in this State by one of the foremost automobile concerns of the middle west has specified that machines would not be accepted unless all gears were enclosed or guarded and all dangerous points protected.

At this time, however, the problem which confronts practically all the manufacturers of the State is the safeguarding of machines which were not properly equipped with safety devices at time of their construction. These devices should be of substantial construction and put in place with a view to permanency. Defective or makeshift guards should be avoided. Workmen will see in their installation only a half-hearted attempt to safeguard a danger point.

CONSTRUCTION AND MATERIAL OF GUARDS.

In the construction of guards the preference should be given to those made of steel or cast iron over those of wooden construction.

In the latter, if applied to a part where they might become oil-soaked, manufacturers will find an increased fire hazard, as well as an increased expense in their upkeep.

POWER CONTROL.

Where a plant or department is driven from a main steam unit through line shafting and belt and rope drives, and also where a department is driven by a separate electric unit, it is desirable that some positive arrangement be provided within each department for shutting off the power, such as an engine or motor-stop, friction-clutch, tight and loose pulley, etc. In cases of emergency the power may be shut off from different

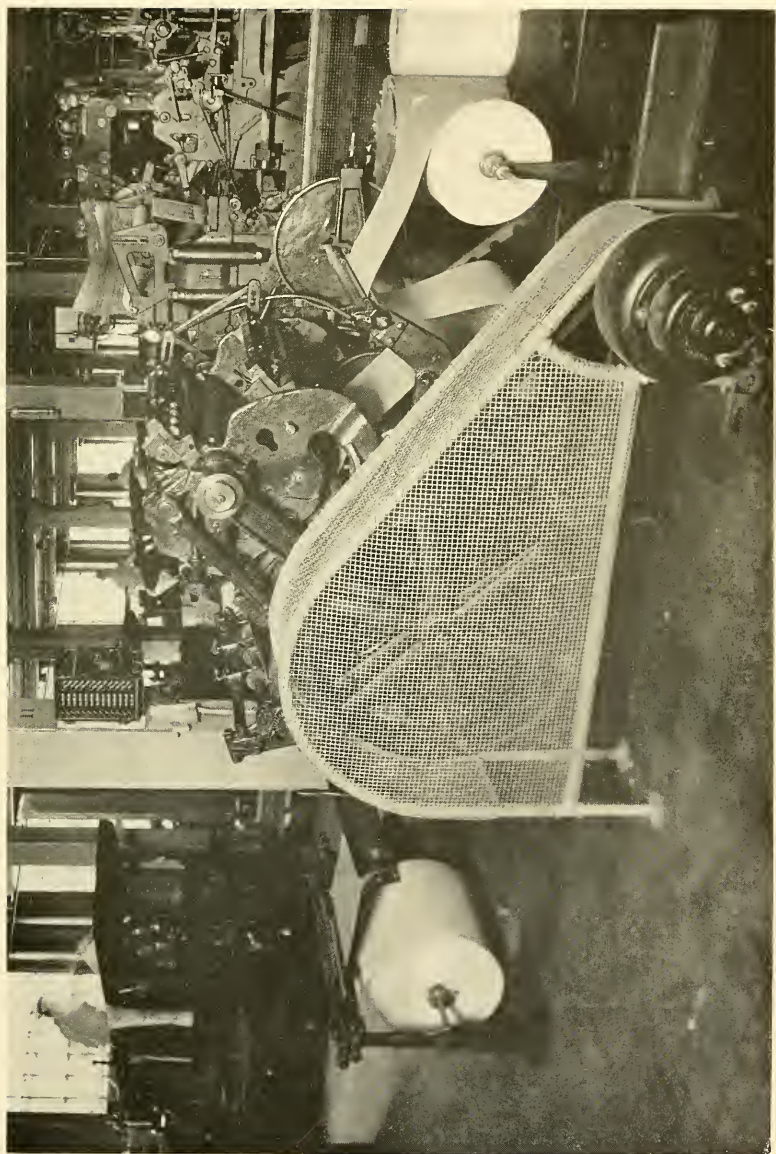


FIG. B. — Guard over belt on printing press.

How infinitely better it is to prevent an accident than to compensate for it! Its prevention is of greatest benefit to the injured, and is beneficial both to employer and insurer. A great percentage of the above could undoubtedly have been prevented.

BELT SHIFTERS.

Belt shifters should be equipped with a positive locking device which will automatically lock belt on either tight or loose pulley. Such a device will prevent belt creeping from loose to tight pulley, thus unexpectedly starting machine, with resulting danger to operator.

This condition applies particularly to machinery in the textile and paper industries, as well as to all industries where the machinery requires a considerable amount of power, and especially where there is but a single operator on the machine.

Many serious accidents have resulted from belt creeping from loose to tight pulley, and there is record of at least one fatal accident being attributable to such cause.

Number of Accidents due to Shifting Belts by Stick or Hand.

Number of non-fatal accidents due to shifting belts:—

First annual report, Massachusetts Industrial Accident Board,	196
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Second annual report, Massachusetts Industrial Accident Board,	142
----------------------------------------------------------------	-----

Number of fatal accidents due to shifting belts:—

First annual report, Massachusetts Industrial Accident Board,	2
---------------------------------------------------------------	---

Second annual report, Massachusetts Industrial Accident Board,	1
----------------------------------------------------------------	---

Number of non-fatal accidents due to replacing belt with stick:—

First annual report, Massachusetts Industrial Accident Board,	39
---------------------------------------------------------------	----

Second annual report, Massachusetts Industrial Accident Board,	17
----------------------------------------------------------------	----

Number of fatal accidents due to replacing belt with stick:—

First annual report, Massachusetts Industrial Accident Board,	—
---------------------------------------------------------------	---

Second annual report, Massachusetts Industrial Accident Board,	—
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The handling and adjustment of large belts, especially in plants where there is a great number of belts, should always be attended to by an experienced belt crew, equipped with proper tools and equipment.

SHAFTING.

Vertical shafts which are at all available should be encased to a height of 6 feet from the floor.

Horizontal shafting less than 7 feet from the floor should be encased or otherwise protected and guarded where the same is over ways of traffic or aisles.

Dead ends of shafting, less than 7 feet from the floor, and projecting more than 2 inches, should be cut off or guarded.

Projecting dead ends of shafting on "Beater" drives of Picker machines should be guarded, as the shafting is sometimes reversed and cannot always be cut off.

Shafting along back of intermediate speeders, or spinning frames, should be totally enclosed along the length of the machine with pipe or other suitable enclosure. There is record of two serious accidents to women while cleaning these machines, their hair becoming entangled in the revolving shaft. In each instance the scalp was entirely taken off.

Exposed and available low-down shafting on machines, in textile industry especially, should be totally encased.

Number of non-fatal accidents due to shafting, set screws and coupling:—

First annual report, Massachusetts Industrial Accident Board, . 481

Second annual report, Massachusetts Industrial Accident Board, 721

Number of fatal accidents due to shafting, set screws and coupling:—

First annual report, Massachusetts Industrial Accident Board, . 9

Second annual report, Massachusetts Industrial Accident Board, 11

SET SCREWS.

Set screws on revolving parts which are exposed to contact should be countersunk or protected by a solid collar; headless or safety set screws should be used, and no part of the set screw should project above the surface.

COUPLINGS AND COLLARS.

Couplings and collars in new construction and in replacements should be of a safety type, without bolts, set screws or other dangerous projections, unless suitably guarded. Present

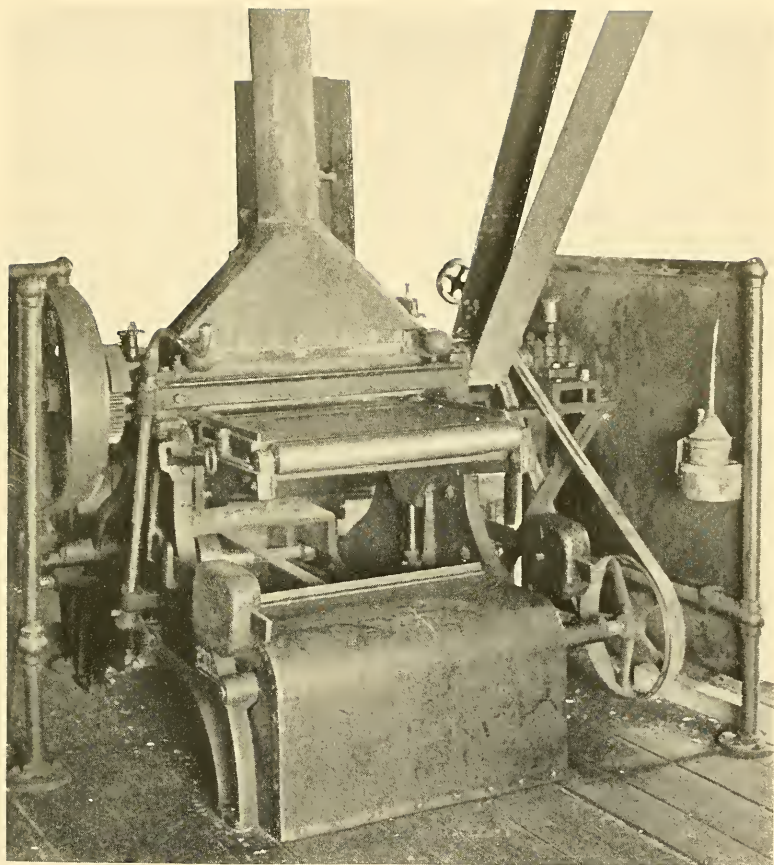


FIG. C.—Surface planer illustrating belt guards, exhaust system for carrying over shafting, also a sheet metal guard over lower drive shaft. Gear guards are illustrated in this print. (Courtesy of the American Steel and Wire Company.)

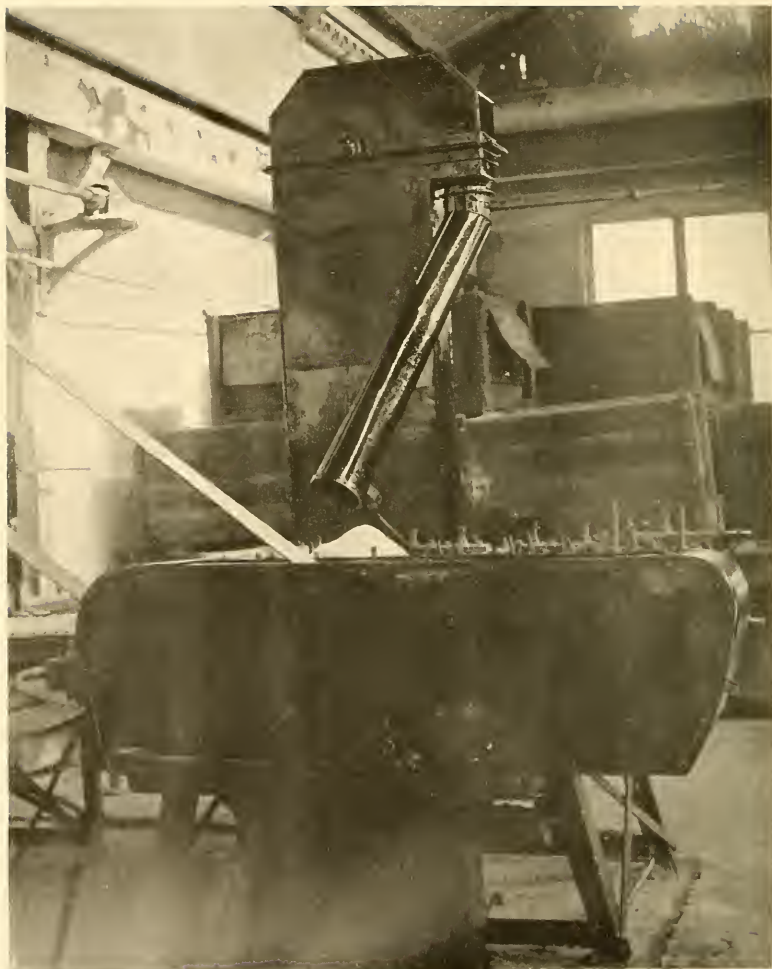


FIG. F. —Dusting machine. Guards in place. (Courtesy of American Sheet and Tin Plate Company.)

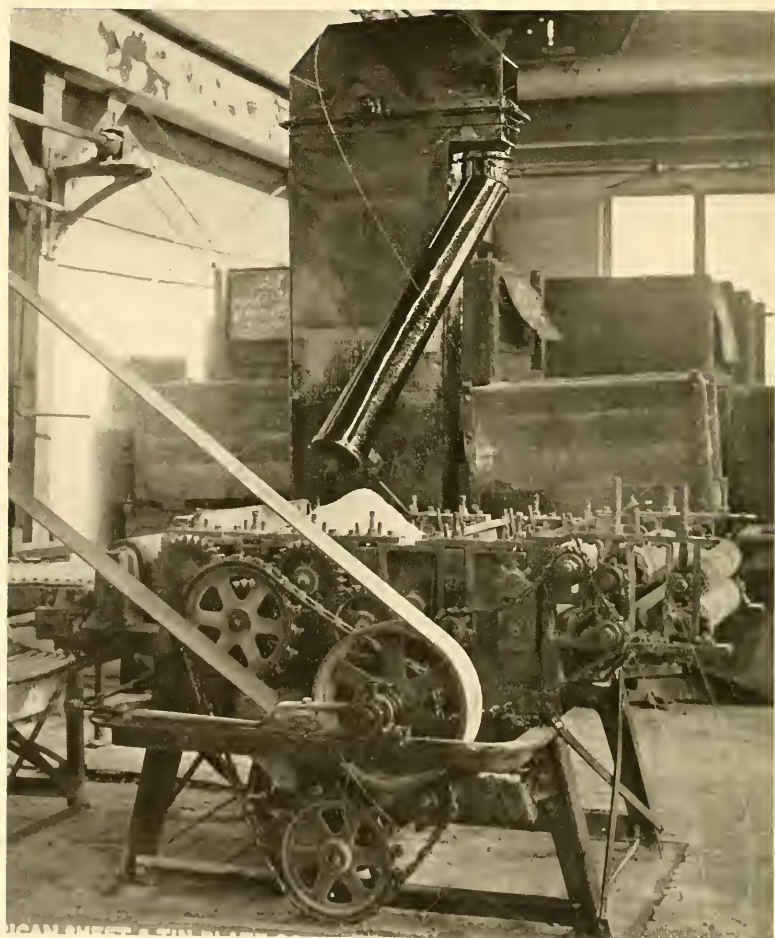


FIG. E. — Guards off dusting machine. (Courtesy of American Sheet and Tin Plate Company.)

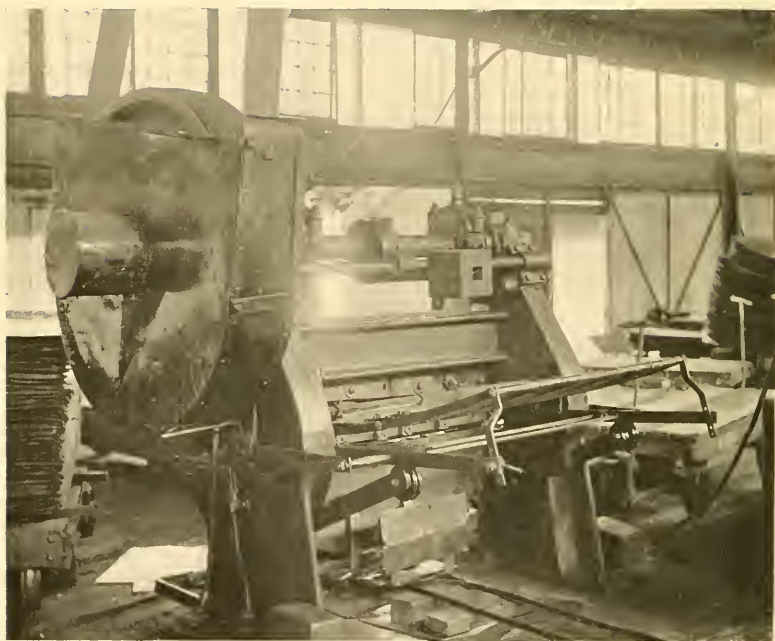


FIG. D. — Guarded wheel and belt — resquaring shears. (Courtesy of the American Sheet and Tin Plate Company.)

installations should be made to conform with this suggestion as soon and as nearly as possible.

PROJECTING KEYS AND UNFILLED KEYWAYS.

Projecting keys on ends of shafts, on presses, textile machines, embossing machines, etc., should be provided with cup-covers, or be suitably guarded. Unfilled keyways on ground level or low-hung shafting should be filled in, either with soft metal or wood strips, finished flush with the shaft.

GEARS.

All exposed in-running gears should be thoroughly guarded. If not entirely enclosed, gears should have a band guard around face, with side flanges extending inward beyond root of teeth. All arm and spoke gears over 18 inches in diameter, when exposed to contact, should be entirely enclosed. All power-driven sprockets exposed to contact should be completely enclosed or otherwise suitably guarded.

Number of non-fatal accidents due to gears: —

First annual report, Massachusetts Industrial Accident Board, 1,101

Second annual report, Massachusetts Industrial Accident Board, 1,228

Number of fatal accidents due to gears: —

First annual report, Massachusetts Industrial Accident Board, 2

Second annual report, Massachusetts Industrial Accident Board, 1

LADDERS.

Permanent stairs should be installed where practicable, in preference to ladders of any type, and fixed iron ladders should be given the preference over the portable type. No pipe or other obstruction should be allowed back of a fixed ladder closer than 7 inches to the rungs.

Fixed iron ladders are especially desirable in boiler rooms, as a most efficient method of reaching the top of the boilers. An iron stairway is seldom possible on account of the small space available. Unevenness of floors and other conditions make the use of portable ladders undesirable in this service.

Portable ladders should be equipped with metal spikes or spurs, or shoes of rubber, abrasive or other non-slipping surface. Metal spikes, spurs or rubber feet are suitable for wood

floors, and feet with abrasive surfaces for concrete or iron floors.

Number of non-fatal accidents due to falls from or with portable ladders:—

First annual report, Massachusetts Industrial Accident Board, . 802

Second annual report, Massachusetts Industrial Accident Board, 970

Number of fatal accidents due to falls from or with portable ladders:—

First annual report, Massachusetts Industrial Accident Board, . 6

Second annual report, Massachusetts Industrial Accident Board, 10

PASSAGEWAYS.

All passageways, traffic ways and gangways should at all times be kept clear, even and in good repair, free from projecting nails, loose boards or planking, or from tools, materials or obstructions over which employees may stumble or fall. Orderliness in this respect will prevent a great many accidents.

Number of non-fatal accidents due to slipping on floor level:—

First annual report, Massachusetts Industrial Accident Board, 1,385

Second annual report, Massachusetts Industrial Accident Board, 1,508

Number of fatal accidents due to slipping on floor level:—

First annual report, Massachusetts Industrial Accident Board, —

Second annual report, Massachusetts Industrial Accident Board, 2

OVERHEAD WALKS AND PLATFORMS.

Platforms and permanent walks over 4 feet above the floor or ground level should have railings. Platforms or walks over 6 feet above the ground or floor level should have a toe board at the base of the railing, approximately 4 inches high. Railings should be approximately 3½ feet in height, with an intermediate rail midway between the top rail and floor, and should be of substantial construction.

All permanent overhead platforms should be equipped with permanent stairway if possible; otherwise, with stationary ladders.

STAIRS.

Stairs should not be built at a sharper angle than 50°. Over 50°, ladders should be used instead.

Stair treads should be kept in good repair at all times.

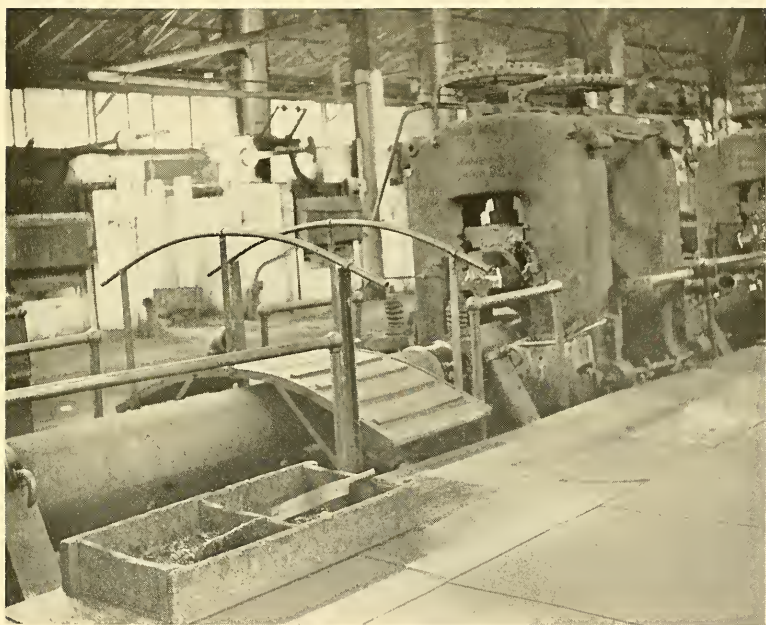


FIG. G. — Rail guard and crossover on roll train pits. (Courtesy of American Sheet and Tin Plate Company.)

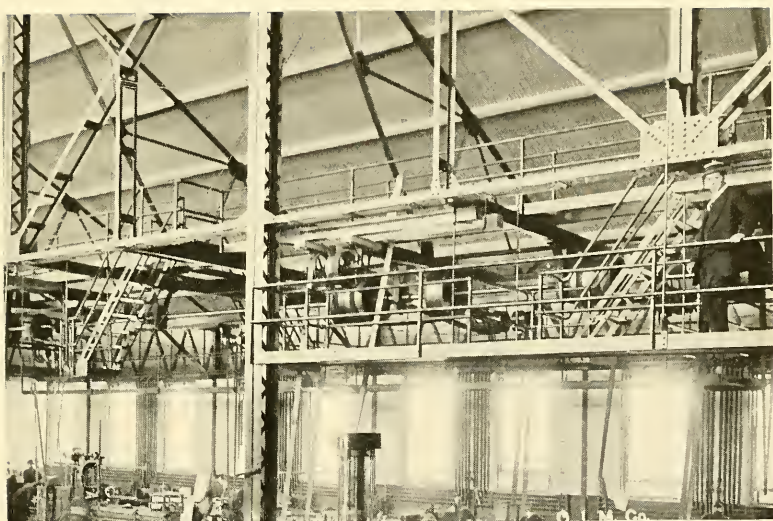


FIG. H. — View showing overhead platform and stairways, handrails and toe boards, giving access to all line shafts, countershafts and bearings. (Courtesy of Oliver Iron Mining Company.)

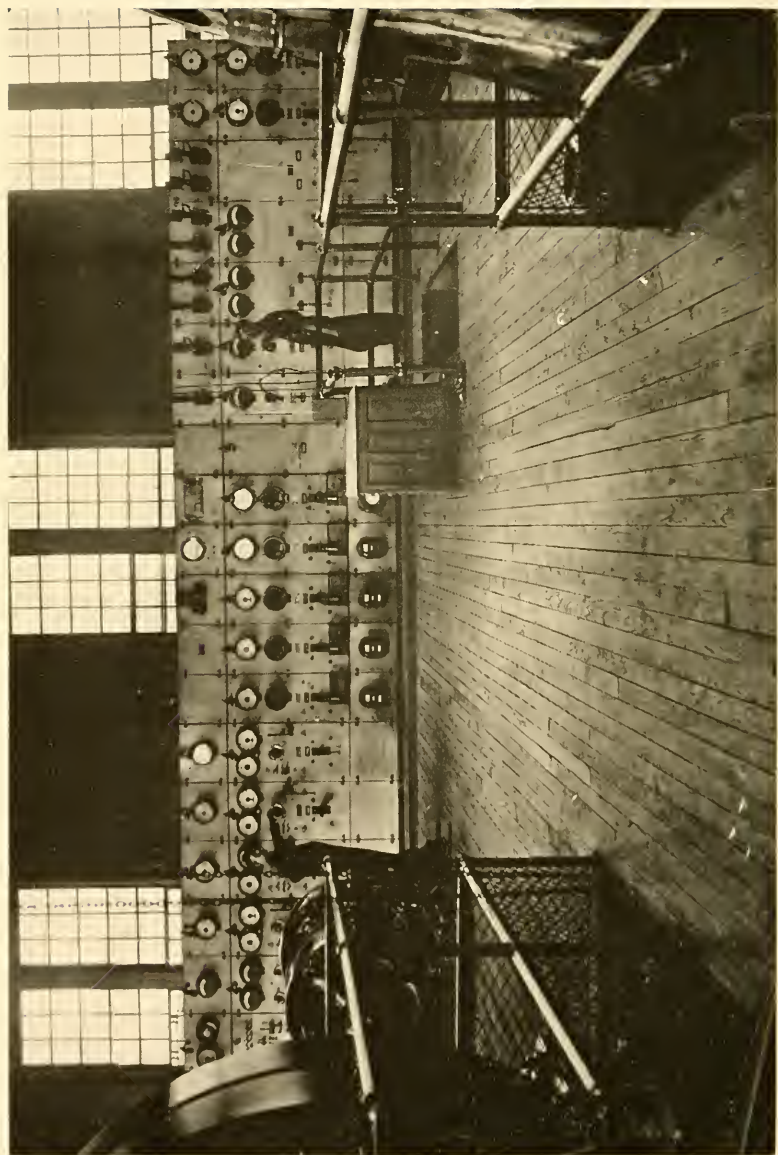


FIG. 1. — Part of electric power plant, having the generator fenced off and rubber mat in front of switchboard. (Courtesy of H. C. Frick Coke Company.)

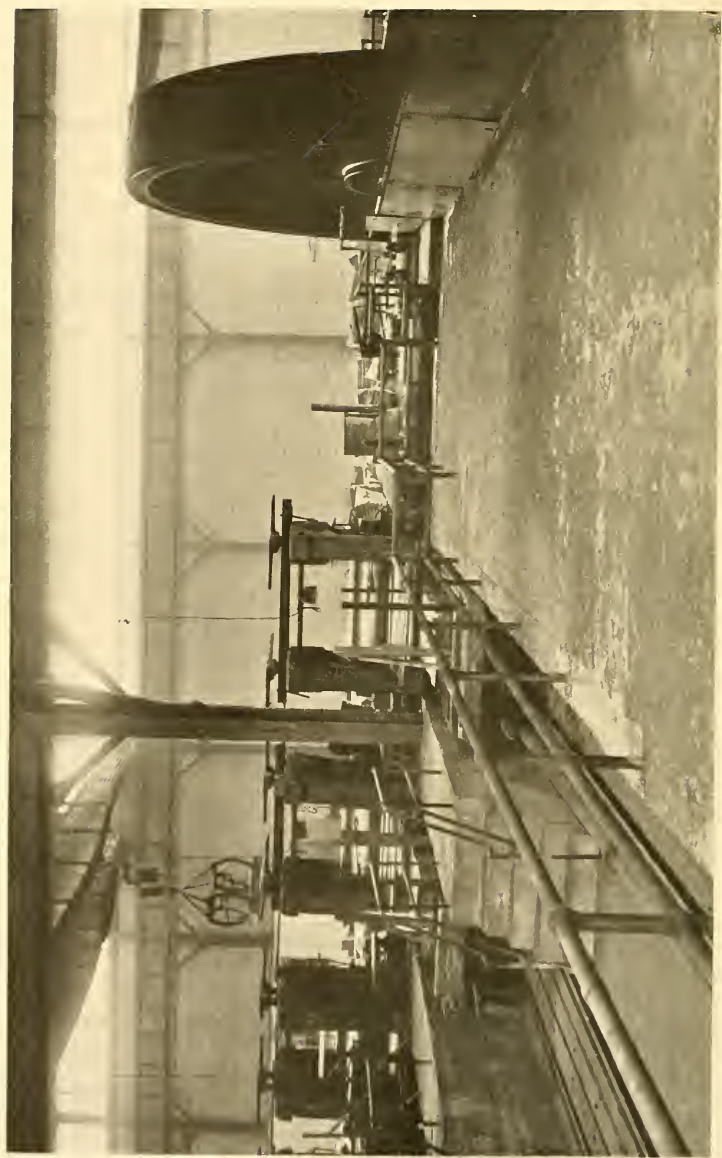


FIG. 1. — Guards around pit and rope drive gear. Cold rolls. (Courtesy of American Sheet and Tin Plate Company.)

Stairs should be equipped with permanent and substantial handrails, approximately 36 inches in height from the center of the tread, and constructed according to standard of pipe-iron work or wood, arranged as follows: —

- (a) On all open sides of stairways.
- (b) On one side of enclosed stairway 4 feet or less in width.
- (c) On both sides of enclosed stairway over 4 feet in width.
- (d) On both sides and in center of stairway over 8½ feet in width.

Note. — Safety treads of non-slipping abrasive surface are desirable for all stairways.

Number of non-fatal accidents due to falls downstairs: —

First annual report, Massachusetts Industrial Accident Board, . 859

Second annual report, Massachusetts Industrial Accident Board, 974

Number of fatal accidents due to falls downstairs: —

First annual report, Massachusetts Industrial Accident Board, . 1

Second annual report, Massachusetts Industrial Accident Board, 3

FLOORS.

Floors should not be littered with materials and should be kept especially free from protruding nails and splinters. Unevenness, loose boards and a slippery condition of the floors should be remedied without delay.

Orderly arrangement of stock tends towards neatness and caution on the part of employees.

HATCHWAYS AND FLOOR OPENINGS.

The above should be guarded by handrails and protected with toe boards where necessary. Handrail should be approximately 3½ feet in height, with an intermediate rail between the top rail and the floor.

Number of non-fatal accidents due to falls in holes and pits: —

First annual report, Massachusetts Industrial Accident Board, . 459

Second annual report, Massachusetts Industrial Accident Board, 499

Number of fatal accidents due to falls into holes and pits: —

First annual report, Massachusetts Industrial Accident Board, . 1

Second annual report, Massachusetts Industrial Accident Board, 5

GOGGLES.

Goggles are recommended to be and should be used by employees when chipping iron, steel or other metals, grinding on emery wheels not fully protected with hood and eye shield, and in pouring babbitt and other molten metals.

The following tabulated toll of eye injuries in Massachusetts industries in the first year of the act emphasizes the importance of the use of goggles:—

EYE INJURIES IN MASSACHUSETTS INDUSTRIES.

Statistics from First and Second Annual Reports of the Massachusetts Industrial Accident Board.

NATURE OF INJURY.	First Annual Report, Number of Cases.	Second Annual Report, Number of Cases.
Both eyes lost,	2	1
One eye lost,	47	78
Other eye injuries,	4,282	6,485
Total,	4,331	6,564

WIRE ROPES, CABLES AND SLINGS.

Wire ropes in all service should be regularly inspected by a competent inspector and a record kept of each inspection, carefully noting the date of inspection and the condition found on such date.

The points to be noted in general are as follows: Number of broken wires, amount of external wear and any local trouble such as would be caused by kinks, etc.

Ropes ordinarily fail gradually by the wearing down and breaking of the wires. A few scattered broken wires may be neglected, but a considerable number of broken wires in one place, due to local injury or otherwise, may render it necessary to replace the rope. No general rule can be laid down for the discarding of a rope, as it is entirely dependent upon the risk involved in the event of the breaking of the rope. A close inspection, at stated intervals, is necessary to insure safe conditions.

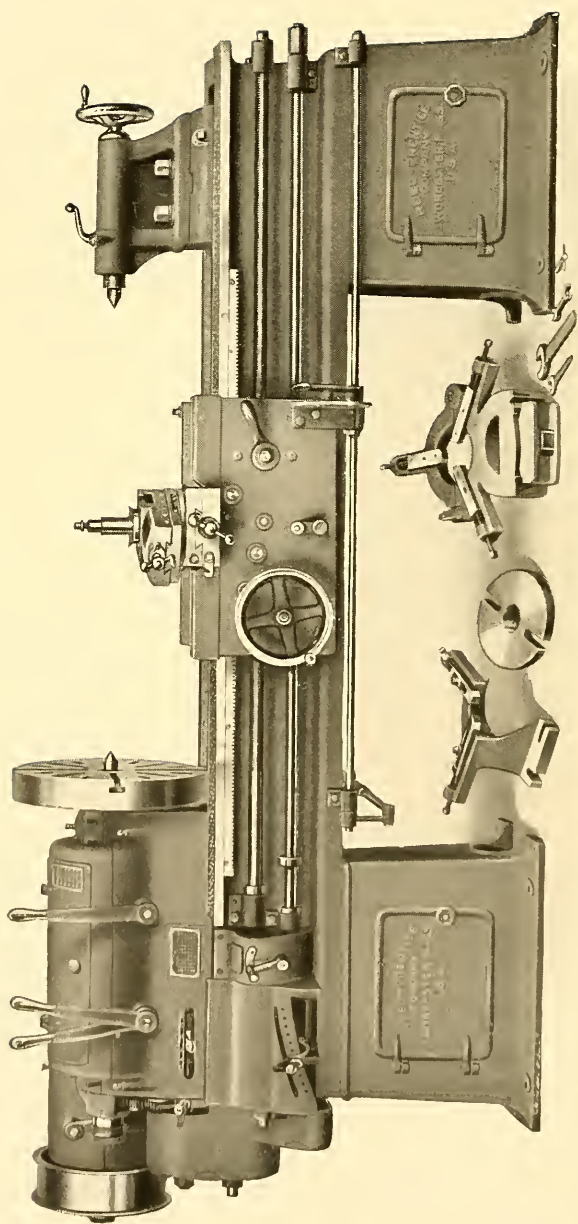


FIG. K. — Lathe with back gears and end feed change gears enclosed. (Courtesy of Reed-Prentice Company.)

The material from which ropes are made has the following nomenclature: —

Iron which has a tensile strength of 75,000 to 100,000 per square inch.
Crucible steel, a tensile strength of 180,000 to 200,000 per square inch.
Plow steel, a tensile strength of about 240,000 per square inch. .

Ropes should be properly lubricated, and where there are any acid fumes present rope should be kept well greased and thoroughly inspected from time to time.

LATHES.

Back gears of lathes should be guarded, and in general end feed change gears should be enclosed or guarded. Belt shifters for lower and upper cone pulley drives are also very desirable, especially when metallic lacing is used.

Number of non-fatal accidents due to metal-working lathes: —

First annual report, Massachusetts Industrial Accident Board, . 698

Second annual report, Massachusetts Industrial Accident Board, 834

Number of fatal accidents due to metal-working lathes: —

First annual report, Massachusetts Industrial Accident Board, . -

Second annual report, Massachusetts Industrial Accident Board, -

This illustration shows the modern lathe, which, it will be noted, is completely guarded.

The builders of this lathe recognized the demand for properly guarded machinery, and practically all purchasers are requiring that machines be completely guarded.

During the past year two injuries at least were recorded as the result of being caught in the back gears of lathes.

LATHE-DOGS.

The projecting set screw type of lathe-dog should be replaced by some type of safety lathe-dog.

Several Massachusetts manufacturers have already discarded the old type of lathe-dog, and the list is continually increasing.

The Plymouth Cordage Company and the American Steel and Wire Company were among the first companies to totally discard the projecting set screw type.

PLANERS.

Counterweights on large planers should be enclosed. This may be accomplished by the use of wire mesh enclosure, or, where planers are located on ground floors, the weight may be lowered beneath the floor and its range of travel consequently be entirely below the floor level. Bed plate fillers should be provided on all large planers.

Number of non-fatal accidents on metal planers:—

First annual report, Massachusetts Industrial Accident Board, . 73

Second annual report, Massachusetts Industrial Accident Board, . 75

UPRIGHT AND RADIAL DRILLS.

Counterweights on upright drills should be enclosed and guarded. Gears should be enclosed with wire mesh or other suitable guards.

Fig. M is an illustration of a modern drill, designed by the Reed-Prentice Company to meet the demand for a completely protected tool.

Fig. N shows a recently designed drill with safety features.

COUNTERWEIGHTS.

Suspended counterweights, overhanging aiseways or passageways, or over operating machinery, should be enclosed.

BLACKSMITH'S TOOLS.

Sledges, hammers, punches, facing tools, etc., used in forge shops and other like departments, should be kept in good condition and properly dressed, as burred or "mushroomed" edges are very liable to fly off, causing serious injury.

An inspection should be made, at regular intervals, to insure keeping this class of equipment in proper condition.

Number of non-fatal accidents due to flying particles from hammering tools:—

First annual report, Massachusetts Industrial Accident Board, . 539

Second annual report, Massachusetts Industrial Accident Board, 553

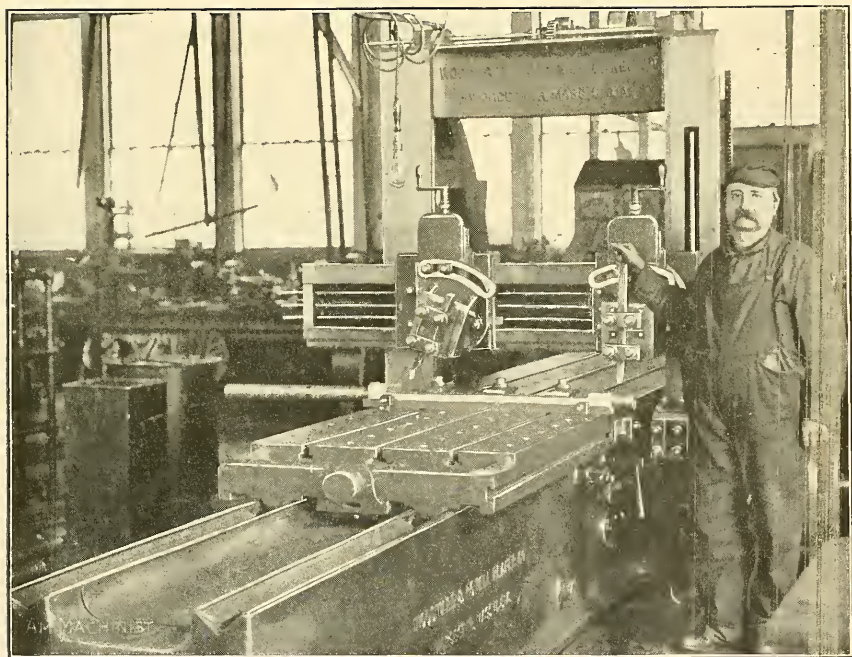


FIG. L. — Guarded planer-bed. (Courtesy of the Massachusetts Employees Insurance Association.)

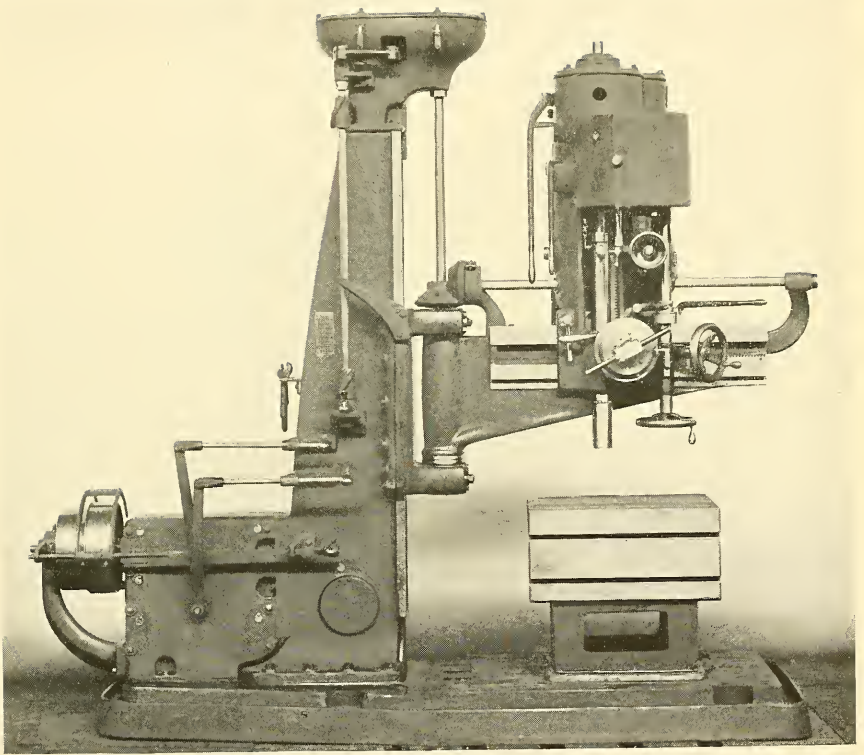


FIG. M. — Three-foot arm ball-bearing radial drilling machine. (Courtesy of Reed-Prentice Company.)

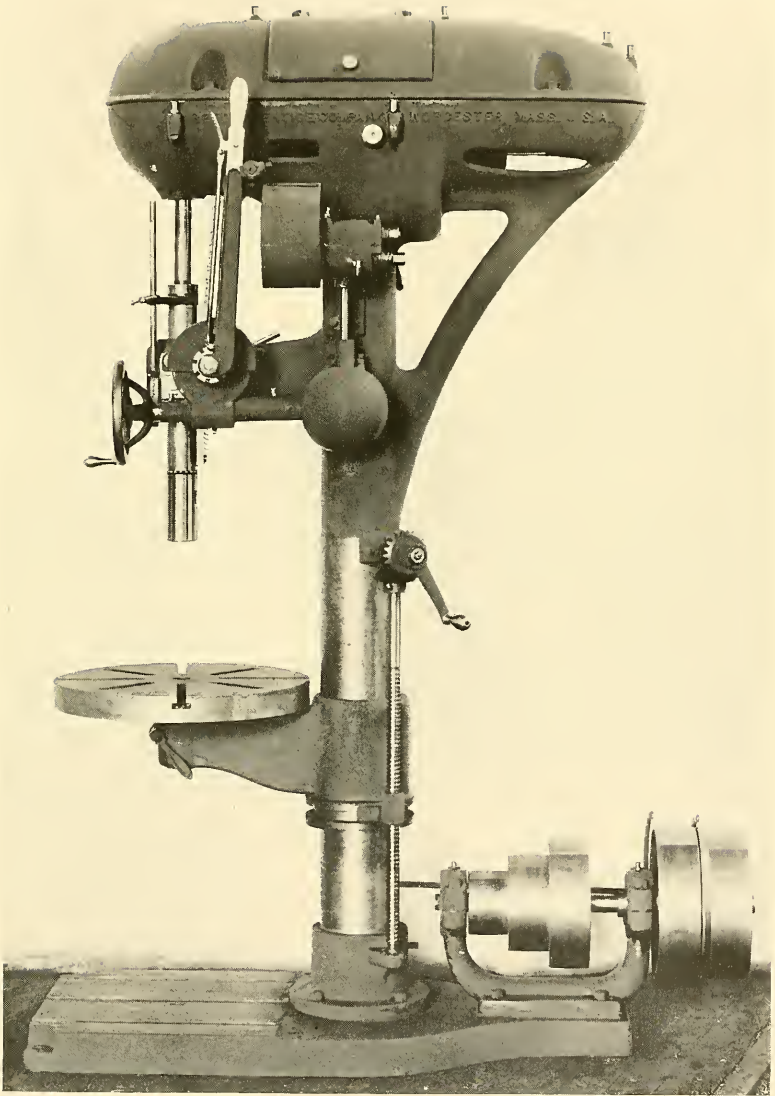


FIG. N. — Twenty-one-inch ball-bearing drilling machine. (Courtesy of Reed-Prentice Company.)

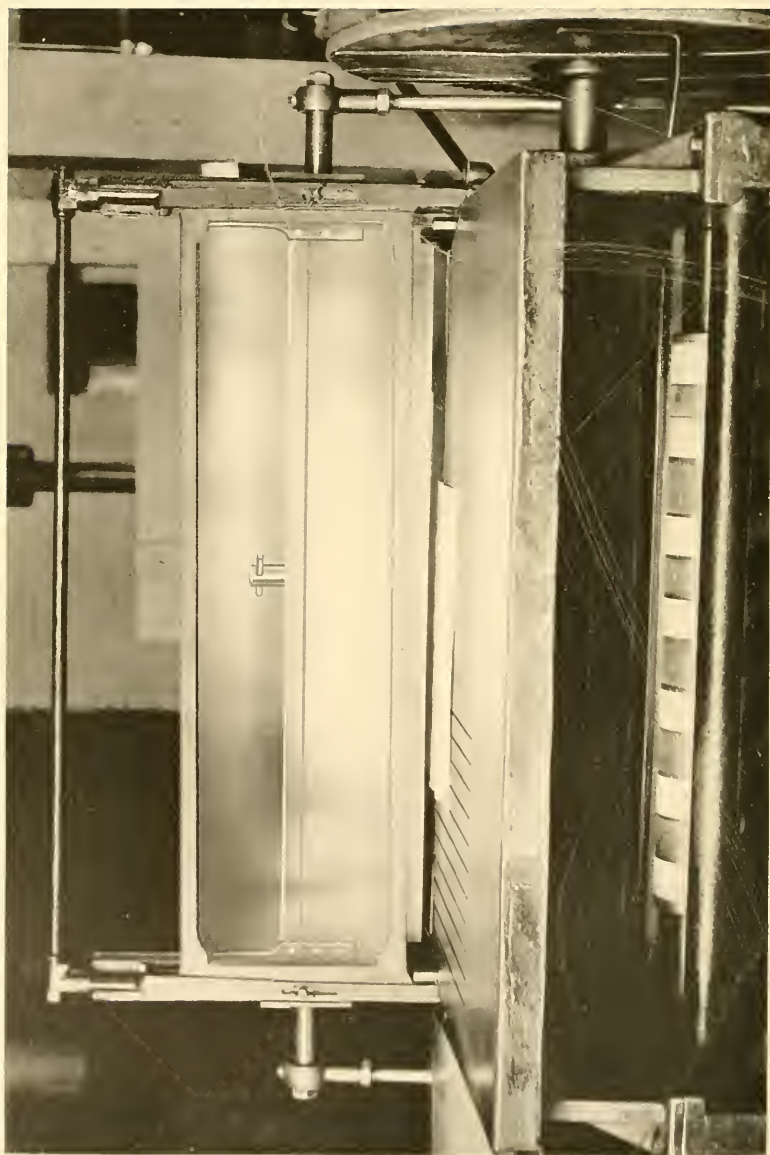


FIG. Q. — Paper-folding machine with adjustable plate-glass guard attached. (Courtesy of Eaton, Crane & Pike Company, Pittsfield.)

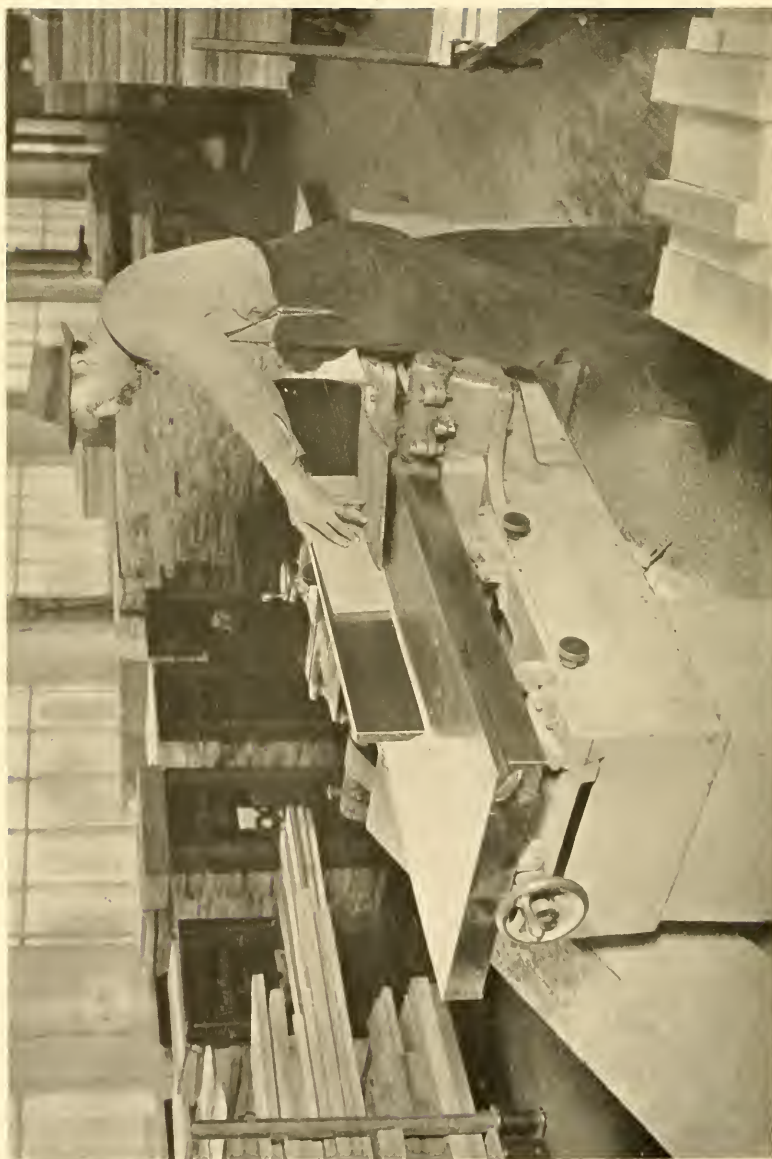


FIG. P. — Guard on planer on woodworking machine.

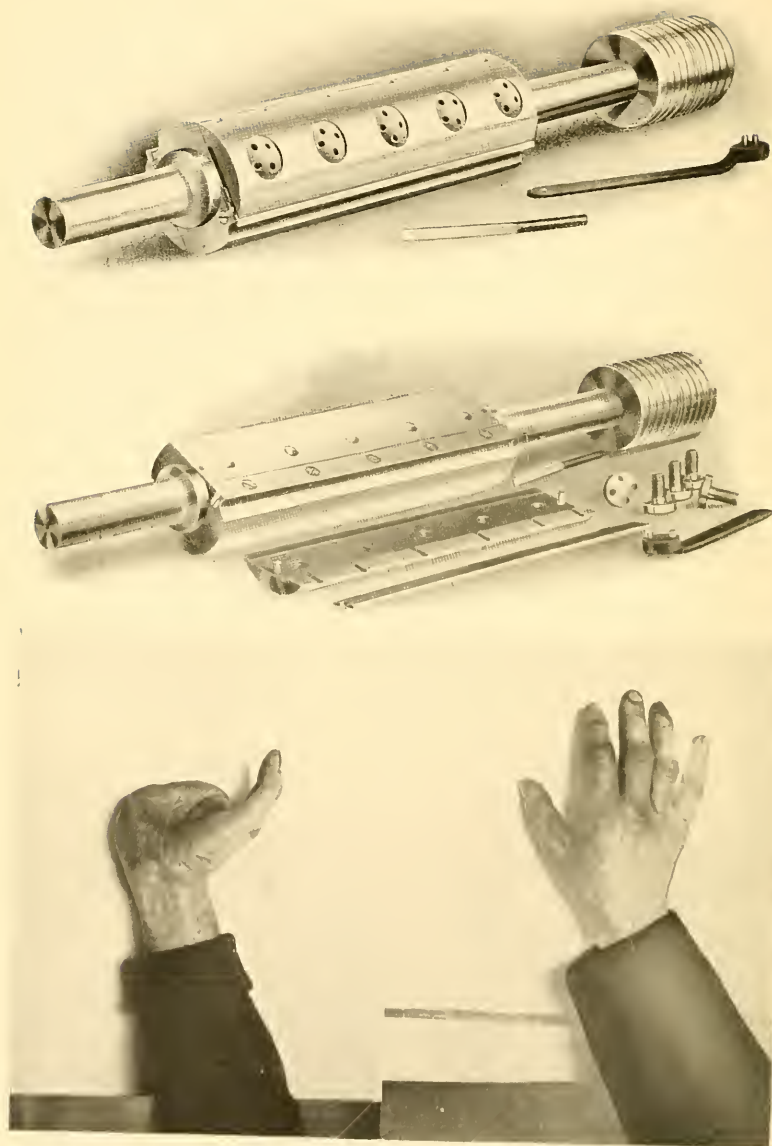


FIG. O. — Upper illustrations show circular safety cylinder; lower left, view of hand injured by old-fashioned jointer; lower right, view of man's hand injured by circular jointer. (Courtesy of the American Museum of Safety, New York.)

BUZZ PLANERS.

The old style and very dangerous square head knifeholders used in buzz planers should be replaced by the safety cylindrical head.

Safety cylindrical heads are manufactured by the following companies: J. A. Fay & Eagan Company, Crescent Machinery Company, Oliver Machinery Company, Bass Brothers and The Nye Company.

INCREASED ACCIDENT PREVENTION PROPAGANDA WITHOUT COST TO THE COMMONWEALTH.

The Industrial Accident Board has assumed the authority given it under the law to investigate causes of injury for which compensation is claimed, and in connection with the discharge of its duty in this respect has called upon the inspectors of the insurance companies under its jurisdiction to aid it in this important field of endeavor.

As the result of favorable action by insurers and their representatives, to the number of 57, at a specially called meeting, the inspectors of the insurance companies, whose salaries will aggregate upwards of \$50,000 annually, have pledged themselves to co-operate actively in the work of accident and disease prevention, the program, as outlined, calling for the active organization of safety committees, in accordance with the plan given in this report, and energetic efforts on the part of all to bring about the removal of dangerous and disease-producing conditions in the places of employment in this Commonwealth.

The Board has been paid an unusual compliment by the adoption and use of its plan of safety organization — as outlined herein and published in a special bulletin — by many insurers.

The Board has received the written assurance of each of the companies transacting workmen's compensation insurance in Massachusetts that they are in hearty sympathy with this plan, and will instruct their inspectors to co-operate in every way, to the end that the great loss through industrial accidents and occupational diseases may be minimized.

By this action on the part of insurers, and their pledge of co-operation, the Commonwealth gains a large voluntary working force of well-trained and efficient inspectors, with no addition to its pay roll. If employers of labor and their employees will join in the movement, Massachusetts will take rank as among the foremost of all States and countries in safety work.

SAFETY COMMITTEES AND THEIR ORGANIZATION.

THE ADVANTAGES OF ORGANIZATION.

Through the organization of efficient safety committees the employers of Massachusetts may save eventually an average of nearly \$40 on each injury reported to the Industrial Accident Board, which subsequently is prevented.

The employees of the State may save through such organization at least 50 per cent. of the loss in wages sustained by them on account of these injuries.

The Board's statistics show that during the first two years' administration of the Workmen's Compensation Act 186,076 non-fatal and 983 fatal injuries were reported.

The average sum paid, and estimated as outstanding, in compensation benefits per case reported was \$22.98. The actual premium cost was slightly in excess of \$40 for each case.

The results accomplished by employers who have efficient safety organizations show that at least 50 per cent. of the injuries which occurred prior to the formation of such committees are preventable. Employers may expect, therefore, to save ultimately the entire cost of insurance on these preventable cases.

There are other possibilities worth while considering by the employers in regard to the safety problem.

By reason of the injuries above referred to the employers lost the services of experienced workmen for a total of 2,493,753 working days. The actual wage loss to the employees was \$6,137,665. The value of the economic loss to the employer by reason of the substitution of less efficient employees constitutes a heavy tax on industry, often overlooked when considering the more tangible and apparent forms of taxation. At least 50 per cent. of this loss may be saved to employers and employees.

Few if any employers would refuse to install a machine or device which would increase production and save labor cost. Yet that is exactly what a safety committee organization does. It keeps the experienced man at his machine during the greatest possible portion of his working life, gives himself and employer

the benefit of his unretarded and most effective service, cuts down the actual cost of compensation insurance, and permits the employee to continue to enjoy and provide the necessities and comforts which the average American family shares.

The plan of safety organization outlined herein need not add \$1 to the fixed expenses of any employer. The present working force of the ordinary plant should be able to discharge the duties made necessary by the organization for safety.

The safety idea should appeal especially to the employer who values human life, human experience and human efficiency, and more particularly to the employer who properly places a high value on business methods which save money.

Shall it be said that any employer will fail to take up the simple task of organizing for safety along the lines herein suggested, when the possibility of such savings in human life and energy, in cost of production and insurance costs, are ahead of him?

CO-OPERATION BETWEEN EMPLOYER AND EMPLOYEE.

Employers and employees alike are concerned directly in the benefits which result from organized safety.

Where the employer gains in efficiency and production the employee gains in like manner. The employee also gains in undisturbed possession of his mental and physical powers, and his chances of injury are greatly lessened. Notwithstanding the fact that his employer pays the cost of workmen's compensation insurance, the actual monetary loss to the employee by reason of injuries received is greater than the benefits which accrue to him under the law.

Employers should encourage workmen to give time and thought to the problems which will arise in connection with the safeguarding of the plant in which they are employed, and the workmen themselves should freely assist the safety organization by giving the benefit of their practical aid at all times.

CAPITAL AND LABOR FAVOR SAFETY ORGANIZATION.

Organized capital and organized labor favor organized safety. The employers' organizations of the country have been endeavoring to encourage such action for a number of years. The Indus-

trial Accident Board has the assurance of the representatives of the Massachusetts branch, American Federation of Labor, and the Boston Central Labor Union that the organization of safety committees is approved by them, and that they are interested in the movement to eliminate unnecessary industrial injuries.

BOARD WILL ASSIST EMPLOYERS TO ORGANIZE.

The Industrial Accident Board will assist employers to organize safety committees upon request.

The plan outlined in this chapter, however, is so simple that the employers should at once commence the work of organizing for safety, and report such action to the Board.

ACCIDENT STUDIES WILL BE MADE.

The Board will prepare, upon request, accident studies covering the experience of each employer who undertakes the organization of a safety committee.

These studies will show the cost of injuries prior to the establishment of a safety committee. Later comparisons will indicate the percentage of reduction effected by such an organization.

ASSISTANCE IN SOLVING SAFEGUARDING PROBLEMS.

The Board has a growing index of the most approved safety devices. This is at the disposal of the employers of the State for the purpose of assisting them in solving the many problems which will confront their safety organizations.

It is suggested that a description of the machine or part which requires guarding be forwarded. The best available information will be promptly given the employer.

A COMPLETE PLAN FOR EFFICIENT SAFETY ORGANIZATION.

The accompanying complete plan of organization for effective accident prevention and education is offered by the Board. It may be used by the small as well as the big employer of labor. The small employer should modify it to meet his needs. The plan may be made effective without adding to the pay roll of the employer, since the existing working force of every plant should be capable of taking up the work in connection with its usual

duties. The only possible exception is the requirement, in large employments, that one employee be assigned to take up the duties of a safety inspector. Ordinarily a practical man can be found who is capable of performing these duties in connection with his routine work. In the exceptional cases, where a safety inspector must be engaged, that alone is the only permanent addition to the fixed expense incurred by reason of the acceptance of the plan.

COMPLETE PLAN FOR SAFETY ORGANIZATION.

Personnel of Safety Organization.

Manager or Superin- tendent.	{	Safety Inspector.	{	Workmen's Committee.
		Permanent Safety Committee.		—— 1 Department.
		Master Mechanic.		—— 2 Department.
		Electrical Engineer.		—— 3 Department.
		Shop or Department Superintendent or Foreman.		

Duties of Safety Organization.

Safety Inspector. — Should be a man of experience and good judgment to keep a record of progress of work and follow up the work and make a monthly report to manager.

General Duties: 1. Inspect machinery and equipment, with a view to ascertaining need of safeguards.

(a) To determine practicability of guards, both by investigation and experiment.

(b) Maintenance of safeguards.

2. Inspect for insufficient lighting.

3. Inspect for orderliness in arrangement of materials and cleanliness.

4. Enforce compliance with fire precautions.

5. Report careless and unsafe practices.

6. Report to manager on all serious accidents.

7. Keep record of accidents prevented.

8. Make regular inspections of particularly dangerous equipment or machinery.

9. Provide that specifications for the purpose of new machinery cover the guarding of dangerous features of same, *i.e.*, gears, etc.

10. Inspect new machinery before same is put into operation, to insure providing of necessary safeguards.

Permanent Safety Committee. — Should pass on all recommendations and determine on their practicability and advisability. Should view site and consider circumstances connected with all serious accidents,

for the purpose of eliminating possibility of repetition, and gain any knowledge which should be applied to prevent other accidents.

General Duties: 1. Promote safety among the foreman and employees.

2. Pass on the advisability of safeguards.

3. Outline rules and regulations for safe operation.

4. Standardized safeguards.

5. Pass on all recommendations made by workmen's committee.

6. Conduct educational campaign.

(a) Proper and thorough instruction of green hands.

(b) Establish bulletin boards.

(c) Set forth instances of accidents prevented to be reported by foreman.

7. Make recommendations on standard requisition forms in triplicate —

(a) To department to do the work.

(b) To department head when work is to be done.

(c) To safety inspector for file.

Workmen's Committee. — Three to be selected from available men from different departments, and to be changed every month (to make at least two inspections per month, and make recommendations if necessary). This practice will interest the employees and educate them to be careful, etc. The interest aroused by the placing of this responsibility on them will have excellent results.

General Duties: 1. Make at least two general inspections per month.

2. Each member to investigate accidents in his own department.

3. Report recommendations in brief form to permanent safety committee.

Joint Action.

Safety inspector and permanent safety committee should act jointly on all recommendations.

In General.

The foremen are responsible for the discipline of their workmen, and should be held more or less responsible for all accidents. Ignorance and carelessness, as contributing causes of accidents, should receive the careful attention of foremen, as these causes can be overcome by proper and thorough instruction. This instruction may often have to be given in a language foreign to the foreman; nevertheless, he should see that instruction or apprenticeship covers a sufficient period to insure that the "learner" understands his work, and especially its dangers, if any exist.

Foremen should hold meetings, monthly at least, to compare notes and profit by each other's experience. A table showing foreman, number of employees and number of accidents, to be issued and posted monthly, would be an excellent means of arousing interest and lessening accidents.

A CONDENSED PLAN FOR SAFETY ORGANIZATION.

The accompanying is condensed from the more complete plan of safety organization outlined in the foregoing pages. A small employer of labor will find it effective in aiding him in reducing the number of preventable injuries. As his business grows, and the number of employees increases, he may amplify it by reference to the complete plan above referred to.

CONDENSED PLAN FOR SAFETY ORGANIZATION.

Manager, Superintendent or Agent.	{	Safety Inspector. Engineer, Electrician or Master Mechanic.	}	Inspection Committee.
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Duties of Safety Organization.

Safety Inspector, Engineer, Electrician or Mechanic.—Duties the same as are outlined for the safety inspector in the complete plan for safety organization on page 258.

Inspection Committee.—The inspection committee should be made up of heads of, or workmen of, each department or division of the business; or of heads of, and workmen of, divisions, depending upon the size of the plant and number of employees. Its duties are the same as outlined in the complete plan for the permanent safety committee and the workmen's committee.

BUREAU OF INFORMATION.

The Industrial Accident Board will maintain a bureau of information for the purpose of assisting employers to solve any of the problems of organization which arise. A statement of the problem should be forwarded to the Board, where a study will be made and a solution suggested.

CONCLUSION.

Either of the two plans may be changed in any way that the employer desires. One or the other should be made effective at once, however, so that the saving in life and suffering and loss may be given an impetus towards the goal that efficient safety organizing is certain to reach,—the elimination of at least 50 per cent. of the waste which comes from preventable injuries.

THE MASSACHUSETTS MUSEUM OF SAFETY.

The Commonwealth has the second largest museum of safety in the country, a large space having been set apart for this purpose at the headquarters of the Industrial Accident Board, 1 Beacon street, Boston, Mass. Here, as the result of months of painstaking effort, have been gathered from all parts of the country, and from foreign countries, models and photographs of the very best safeguards and devices for the prevention of and the minimizing of industrial accidents and occupational diseases for which compensation may be claimed under the Workmen's Compensation Act.

The museum, and the organization connected therewith, has become the clearing house for ideas and devices which will aid employers of labor to reduce the number and cost of personal injuries in employment at least 50 per cent., and ultimately bring about a lower rate of insurance under the compensation law. There are on exhibition at the present time hundreds of devices which have proved their efficiency in protecting workmen from the loss of earning power through personal injury, and several thousand photographs, comprising pictures of nearly every known device for accident and disease prevention in use in the world.

Many visitors come to the museum for the purpose of receiving information in regard to needed devices; and the Board finds that there is a constantly increasing interest in the possibilities of accident and disease prevention by the use of preventive devices and precautionary measures. Employers and their representatives, individual workmen, representatives of organized labor, safety engineers, visiting experts from other States, workmen's compensation investigation commissions and boards, and others interested in the possibilities of the safety organization movement, call and receive personal attention and advice; and the Board has been assured that the assistance given through the museum and its service meets with the approval of all.

By reason of its affiliation with the American Museum of Safety, the Board has been given access to the literature, pho-

tographs and devices on file there, and has received invaluable assistance from that source. Many manufacturers and insurers in this and other States have contributed, without cost, valuable exhibits, photographs, blueprints and literature.

A section of the museum is set apart for the display of microscopic views of occupational dusts, such views graphically visualizing the dangers of diseases from that source and emphasizing the need of protection to the workers from such sources.

By means of individual studies of causes of personal injuries, followed up by investigations of the conditions which bring about these causes and recommendations for their removal, backed up by the models, devices, safeguards, photographs, literature and bureau of information available at the Museum of Safety, noticeable progress is being made in the safety movement which will increase materially in the years to come.

A PRACTICAL SAFETY LIBRARY.

The Board has a modern and practical safety library for its own use and those of the public who are interested in safety problems, at its headquarters in the New Albion Building.

Here will be found the latest and best publications of the United States and foreign governments, as well as the pamphlets and literature issued by this and other boards and commissions of the various Commonwealths.

The safety and engineering magazines are carefully perused and clipped each month, classified by subjects, properly indexed and filed for future reference. Standard publications on safety and allied subjects, also, are on file there.

This literature becomes instantly available by means of a cross index by subjects and the States or countries publishing same. As an aid to effective and systematic accident and disease-prevention work the library has proved invaluable.

INSURANCE COMPANIES AND ACCIDENT PREVENTION.

The work which insurance companies have done in co-operation with the Board in the matter of accident prevention and reduction is worthy of commendation. The Board feels that very important results can be accomplished by having inspections made along definite and uniform lines. The reduction of industrial accidents requires more than scattered inspections and reports as a result thereof. There must be a constant and uniform effort at all times to prevent whatever has been accomplished from being lost. This means that inspections must be made with a fair degree of regularity, and in the meantime that the individual concerns must not lose sight of the importance of keeping the work at all times up to standard. This Board, together with the insurance companies, can do a great deal to start the work of accident prevention, and also to further the work begun, by making inspections at sufficiently regular intervals. In addition to this there is needed the co-operation of employers.

To illustrate the manner in which insurance companies are carrying on this work, the Board has invited the various companies which carry compensation insurance to submit for publication their views on accident prevention and some of the results which they have accomplished. The remainder of this chapter is devoted to the returns made by these companies.

THE ÆTNA LIFE INSURANCE COMPANY.

During the past year this company has increased the efficiency of its inspection service to a considerable degree. The prevention of industrial accidents has become of such vital importance to all companies writing casualty insurance that it would be inconsistent with good business methods not to try to eliminate hazards and improve the general working conditions in the plants and appliances which they insure. To that end the company is devoting its best energies, believing that the results attained amply compensate for the time, money and labor expended.

Although the inspections which this company makes are more rigid to-day than ever before, and greater demands are made upon the owner and employer in the way of safeguards and general safety improve-

ments, it is very gratifying to report that we have met with splendid co-operation from those with whom we have had to deal. We have found in the course of our work that the employer is becoming more and more alive to the fact that his own interests are best conserved by the absence of accidents among his employees; hence we are finding it much more easy than formerly to get him to carry out the recommendations which our inspectors make.

We have also found that the most efficacious road to securing the co-operation of the employer is getting him interested, and our inspectors therefore are instructed before leaving a plant to go over the recommendations with the responsible head of the concern, if possible, so that he may understand at first hand what is required and why. As a rule, there are many things connected with an inspection that the employer would like to inquire about, and many suggestions that might be objected to when merely submitted in a written report are readily accepted when the reasons for them are explained in person.

We have made special efforts to induce the employer to establish a safety committee in his plant composed of his own workmen, and have been successful in getting this done in many cases. This is a part of our inspector's regular work when inspecting a plant, and the information which he is able to impart as to the best method of appointing these committees and what they are to do is very much appreciated by the employer. On quite a number of occasions certain of our inspectors have delivered talks on accident prevention upon invitation at meetings of employees in plants which they inspect. Such talks have been very helpful in arousing the interest of the men, as they like to hear from a man who has been around among other plants just what is being done in the line of safety work in those plants. The information which the inspector is able to give stimulates in them a desire to have the conditions under which they work equally good. These safety talks by our inspectors have not been confined altogether to plants that we insure, but have also been delivered in plants with which we have no business dealings. We are glad to extend this help as far as we are able, as we believe that the larger the number of people who know of accident prevention work, the greater will be the ultimate benefits to all concerned. As an incentive to the appointment of a safety committee, we have prepared and furnish to our assured a blank inspection form especially adapted for the committee work, as follows: —

Inspection Report.

The man or men assigned to the safety work in this plant shall make a thorough inspection of the entire plant each week; examine carefully the condition of all buildings, stairs, fire appliances, boilers, engines, transmission machinery, belts, pulleys and working machines; note carefully the condition of the present guards, and give special attention with the view of installing additional safeguards; note carefully the possibility of inaugurating additional safety rules.

Date of inspection Date of last inspection.....
 Names of inspectors

Buildings. — State condition of walls, foundations, floors, floor supports, floor openings, signs and all outside trimmings, etc.....

Stairs. — State condition of supports. Note if treads are badly worn, nail heads protruding, hand railing complete and in good condition.....

Fire Hazard. — Give condition of all fire appliances, fire escapes, existence of any explosives or inflammable substances, etc.; state where, and what kind of waste and rubbish not kept cleaned up by workmen.....

Any smoking detected in building since last inspection.....

Date of last fire drill..... Time to empty building.....

Boilers, Engines and Transmission Machinery. — State condition of piping, valves, runways, ladders, etc., and condition of guards about flywheels, also for all transmission belts, pulleys, shafting, and state if any additional safeguards are necessary.....

Machines. — State what guards are found not in use and where guards should be provided.....

Recommendations......

On the last page of the report are printed the following suggestions for the guidance of the plant inspectors: —

Suggestions.

For getting rid of the protruding set screw, use a good make of hollow set screw, a solid or split safety collar.

Protruding set screws should be removed from the hub of pulleys when near bearings, or exposed in any way.

Belts and pulleys in a passageway, or on a machine so as to be exposed to workmen, etc., should be guarded with sheet metal, or by using an angle iron or pipe frame filled in with wire screen or expanded wire metal; the guard should offer full protection from contact with either belt or pulley.

All gear guards should be constructed of sheet metal, and should completely cover the face and extend down at sides to at least the bottom of teeth; bevel gears should be completely housed.

For guarding all low-running shafting or overhead shafting so located that an employce can come in contact with it, use a slip sleeve covering or a V or U shaped covering; also iron frame covered with wire screen can be used.

If not possible to use a safety type of shaft coupling the ones with protruding bolts should be housed.

Where a counterweight is located so as to be possible to fall on a workman it should be encased, or a safety chain attached. Doors used as fire exits should never open any other way than away from the employees going from workroom to street.

An unguarded floor opening of any kind should not exist in a plant; proper guarding is that of a double railing 3½ feet high, with a toe board (toe boards prevent articles falling on persons below).

Belt shifters are intended for all tight and loose pulleys, and can be easily constructed of bar iron, pipe or wood.

Grinding wheels explode from various causes. Hoods built of wrought iron will arrest the flying pieces. The manufacturer can furnish safety flanges.

A ladder is not safe unless provided with spiked heels or safety basswood or carborandum shoes.

Study the operation of each machine, learn how the operator can become injured, then study an efficient guard that will prevent the occurrence of such an accident.

In various plants throughout the country the safety man, or safety committee, has reduced the number of accidents 35 to 75 per cent.

In various plants throughout the country it is a proven fact that a large percentage of preventable accidents are prevented by safer methods of doing work, safety rules, etc., governing the employees.

Accident prevention promotes efficiency.

The guard will protect when the workmen forget.

In the past year the *Ætna* has added materially to its force of inspectors, this being necessary owing to the increased business and the greater demand for personal co-operation on the part of our inspection staff with the assured, which naturally consumed more of the individual inspector's time than would ordinarily have been the case.

The *Ætna* field inspection staff now comprises a force of more than 100 men. In the home office 30 clerks are employed to look after the work resulting from the inspections, while in the company's various branch offices throughout the country numerous others are employed. In taking on a new man he is never permitted to make inspections until he has been thoroughly schooled in the company's requirements by some of the experienced inspectors. It has often been demonstrated that no man, no matter how well qualified he may be from a mechanical standpoint to become an inspector, can at the outset make a satisfactory inspection by himself. To send out a man to inspect a plant without the proper training is not fair either to the inspector or to the concern. We therefore believe it good practice to have the new man go out with an old inspector and observe how an inspection is made by the experienced man. What with the new man asking questions and the other answering them, and pointing out and explaining why this and that should be done, the new man learns very quickly and is soon qualified to inspect alone.

The total number of inspections made by the *Ætna* Life during the year was 36,243. The number of recommendations for safety improvements amounted to 107,578. Of this number 57,559 were carried out, some of which are the following:—

Guarding dangerous belts and belt holes,	9,583
Guarding dangerous gears,	8,145
Guarding dangerous pulleys,	6,046
Guarding dangerous protruding set screws,	4,784
Guarding dangerous shafting,	3,069
Guarding dangerous elevator shafts and entrances,	1,690
Renewing elevator cables,	1,149

In about 8,000 plants inspected in connection with employers liability and workmen's compensation policies, almost 94,000 recommendations were made, an average of nearly 12 recommendations per plant.

One of the most difficult things to get done, notwithstanding the fact that in many instances it is a very simple matter, is providing proper

protection for elevator shaftways and entrances. With some persons any kind of an old rickety gate, bar or chain at an entrance seems to be considered sufficient protection, and this applies particularly to elevators used for carrying freight. Most elevator accidents are directly or indirectly the result of improper protection of the shaftway in one way or another, and a very large percentage of these accidents are fatal. Special attention, therefore, has been directed to eliminating this common danger by having elevator platforms enclosed at the sides, enclosing the shaftway, providing proper and substantial doors or gates at the entrances, etc. As a result, many of these dangerous conditions of long standing have been eliminated by following out the suggestions of our inspectors.

It has been very encouraging to note the very complete method in which safeguarding has been done in many plants which we inspect. The work is done with a view to permanency. The guards are not only substantial, but are of neat design, so as not to be out of harmony with the otherwise general good appearance of the plant.

The *Ætna* has always been in hearty accord with the idea of educating the general public in the ways of accident prevention, and in the past year, as in previous years, has availed itself as fully as possible of opportunities presented for preparing and showing accident prevention exhibits at safety and welfare expositions held in various cities. Such exhibits comprise safety appliances of various kinds; photographs illustrating how machinery and dangerous places are and can be safely protected; broken and defective parts removed on the recommendations of our inspectors, which were a menace to safety; and *Ætna* publications treating on the subject of accident prevention. These exhibits have always received a great deal of attention and are evidence of the growing interest of the general public in safety work.

Because of this manifest interest of the public, the *Ætna* has felt encouraged to make its accident prevention exhibits on an increasingly broad and comprehensive scale. In addition to what we have been doing it is our purpose to show actual shop conditions with moving machinery safeguarded and other safety features according to present-day standards of protection. An exhibit of this character has been prepared for the Panama-Pacific Exposition to be held in San Francisco in 1915, a space 19 by 60 feet having been secured for the purpose, and we think it will be the most complete exhibit of the kind ever shown in this country.

One of the most interesting features of the exhibit is a model of a factory plant about 4 feet square. The machinery, such as lathes, milling machines, punch presses, drop hammers, drill presses, emery wheels, band saws, circular saws, shafting, etc., is all of miniature size. The factory is divided into two parts. One part shows a model shop where everything possible in the way of safeguarding is provided. The ma-

chinery is so laid out that there is plenty of room to move about. The lighting facilities are according to the latest and most approved method, being so arranged that the light will not shine into the workman's eyes while he is at work. A complete sprinkler system is provided. Then there is an elevator equipped with the latest in the way of safety devices; also a fire tower to illustrate that method of escaping from a building in case of fire. The power to run the machinery is furnished by a small electric motor.

The other part of the building shows the conditions in what could not be called a model shop, but closely resembles many plants all over the country. There are no safeguards on the machines, no handrails on the stairs, and the machines are crowded and arranged without system. The light is poor and badly arranged, and there are no fire escapes or sprinkler system. The contrast between the two shops is very marked, and the whole constitutes a splendid object lesson in safety work in factories.

The *Ætna* also has an accident prevention exhibit at the Panama-California Exposition in San Diego, Cal., throughout the year 1915, which is very similar to the one prepared for the San Francisco Exposition. It lacks the running machinery and model shop, but has some other distinctively attractive features.

The following pictures show sections of the *Ætna's* Panama-Pacific exhibit: —

Fig. 1 shows bench drill with belts, pulleys, gears and spindle enclosed. One side of the guard frame is shown open and an upper part raised, the parts being hinged to permit easy access to the machine. The drill spindle is provided with a safety chuck.

On the right is a motor guarded; also the belt running from same.

On the left is a Norton Grinder, with protecting hood.

Overhead horizontal belt protected underneath.

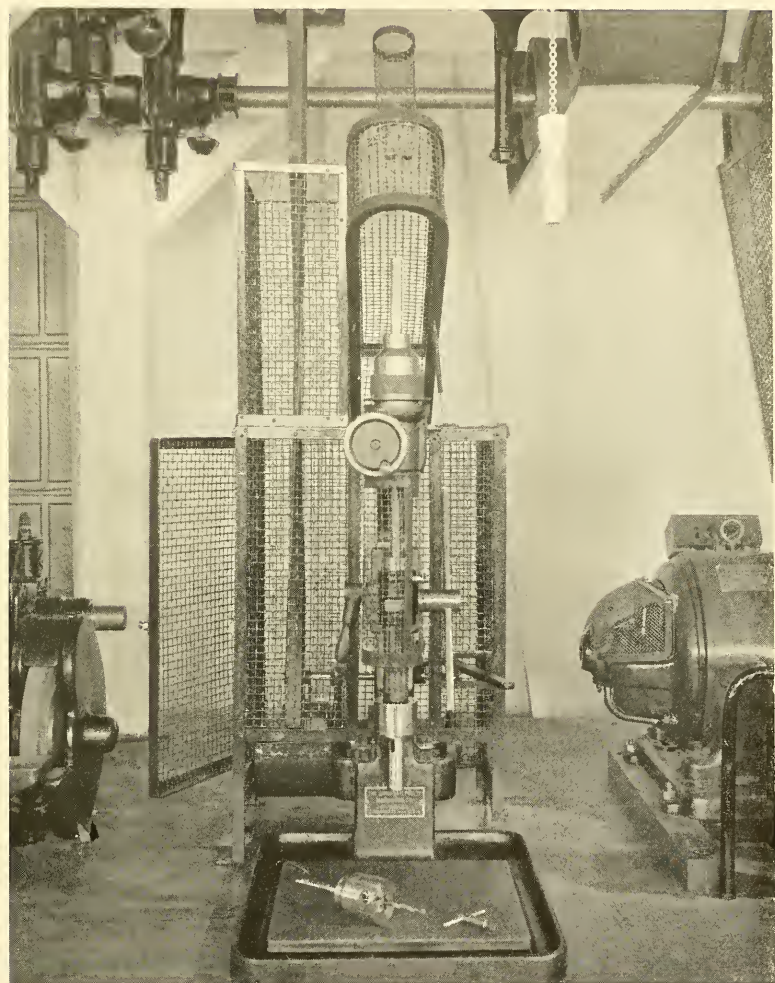


FIG. 1.

Fig. 2 shows a belt shifter, devised for shifting belt on cone pulleys. Screen guard placed in front of lower pulleys and belt.

The low shafting in rear of shifter is "dead," and is used for the display of dangerous couplings, clutches, collars with protruding set screws, etc.

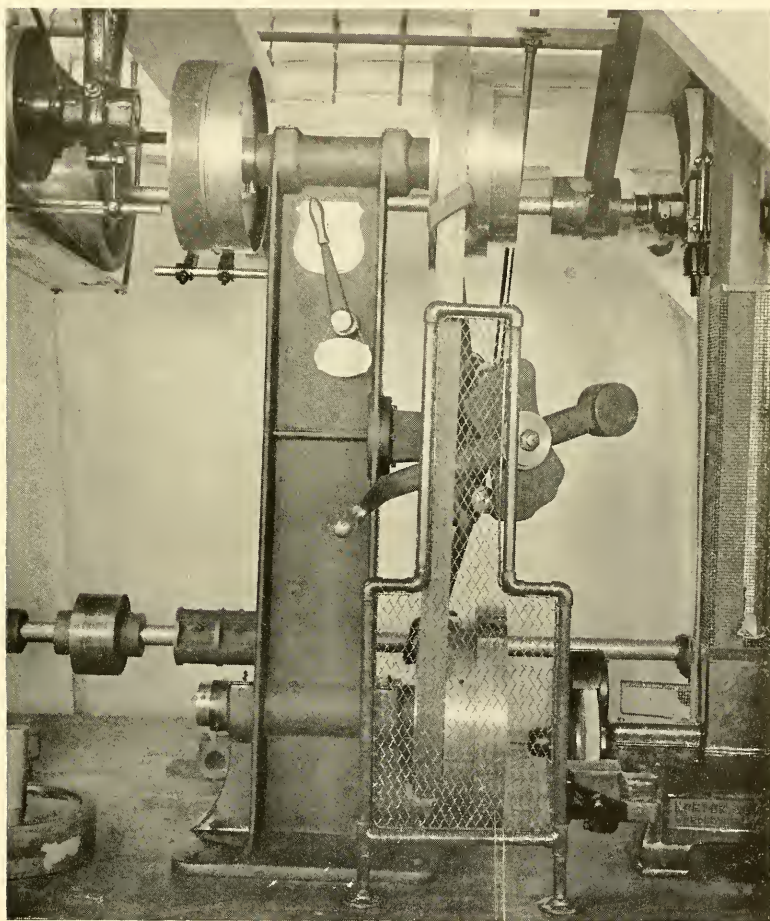


FIG. 2.

Fig. 3 shows, on the right, a small Bliss bench press with drive belt and pulleys enclosed. Side of guard is hinged so that it may be opened. The press is equipped with a non-repeating safety type of clutch.

On the left is another Bliss bench press with belt and pulley guarded. This press is tripped by hand, which is done by pulling down the wire mesh guard extending across the front of press.

Note the manner in which the overhead horizontal belt is guarded.

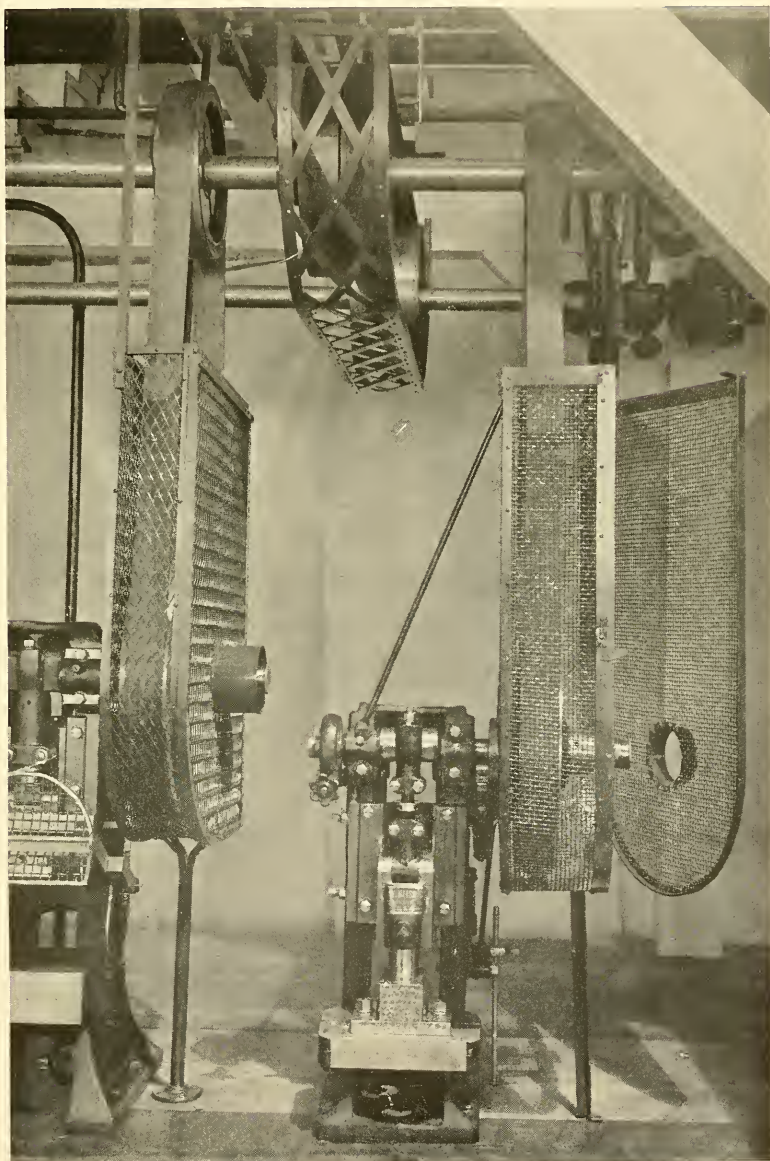


FIG. 3.

Fig. 4 shows boring machine with boring bit guarded, also the belt and pulley guarded. Note in the upper part of the picture how the dead end of shafting is enclosed with wire screening.

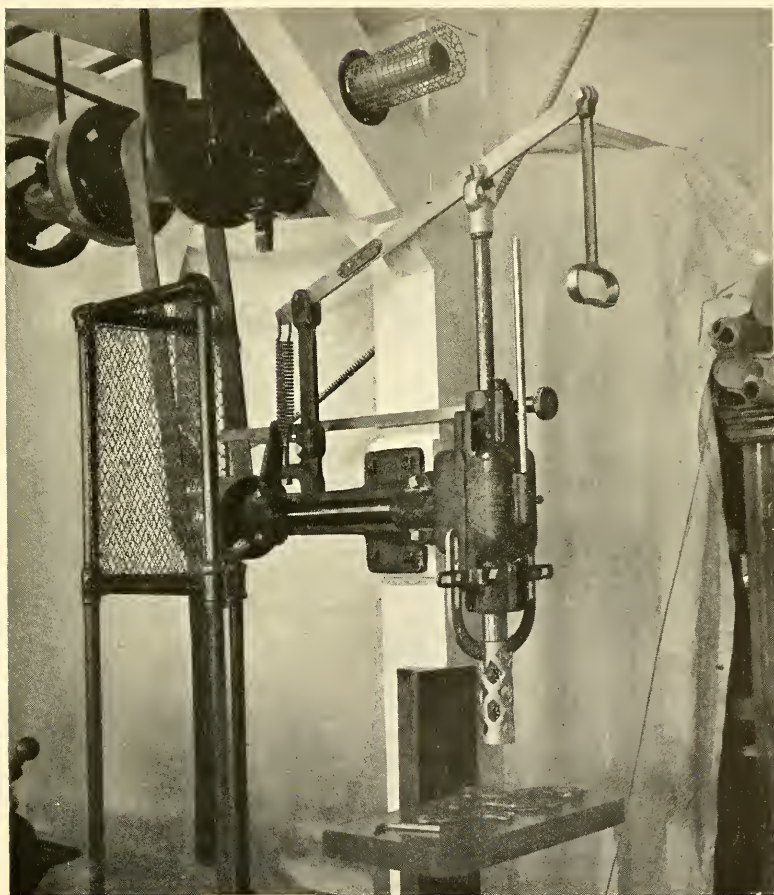


FIG. 4.

Fig. 5 shows Bliss punch press with following safety features: —
Dial feed.

Point of operation guarded; ram enclosed, with opening in front to observe work.

Belt and pulley guarded.

Individual motor drive controlled by safety switch.

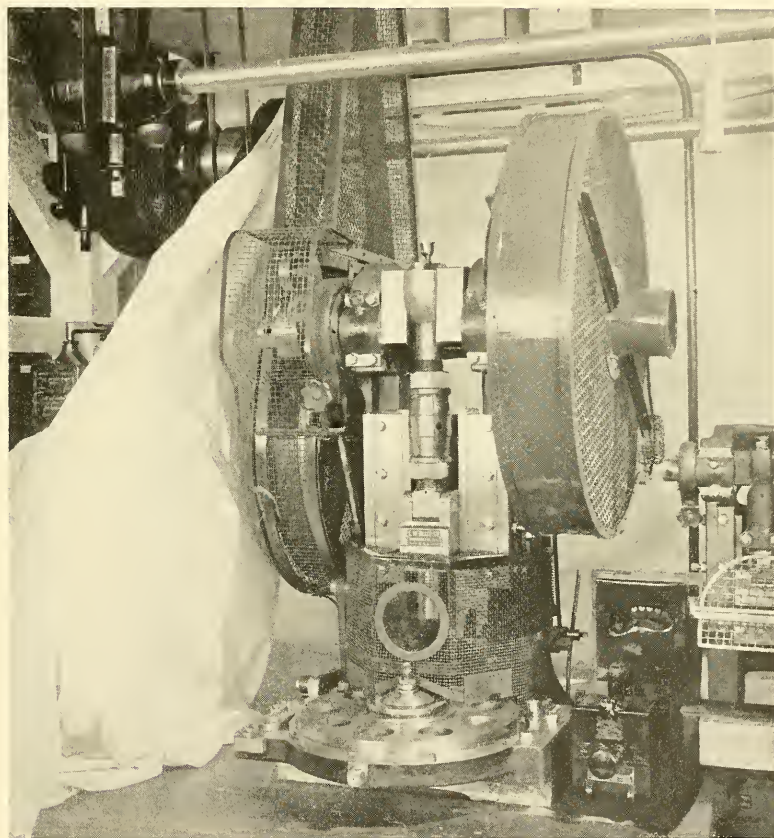


FIG. 5.

Fig. 6 shows types of material used in the construction of safeguards.

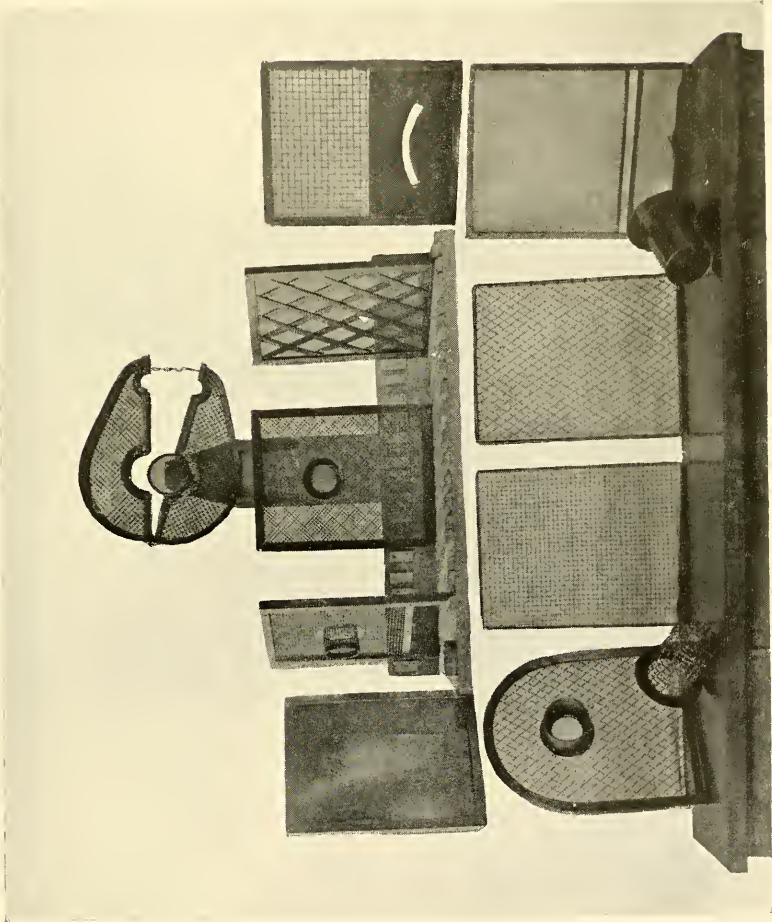


FIG. 6.

Fig. 7 shows an automatic roll feed punch press in the L. C. Smith Bros. Typewriter Company's plant. The distinctive safety feature connected with this press is the metal housing over the feed rolls at front and back of the machine. The material is fed to the dies in long strips, entering and passing between the rolls through the narrow openings in the housing, thus eliminating any danger of the fingers getting caught in the rolls.

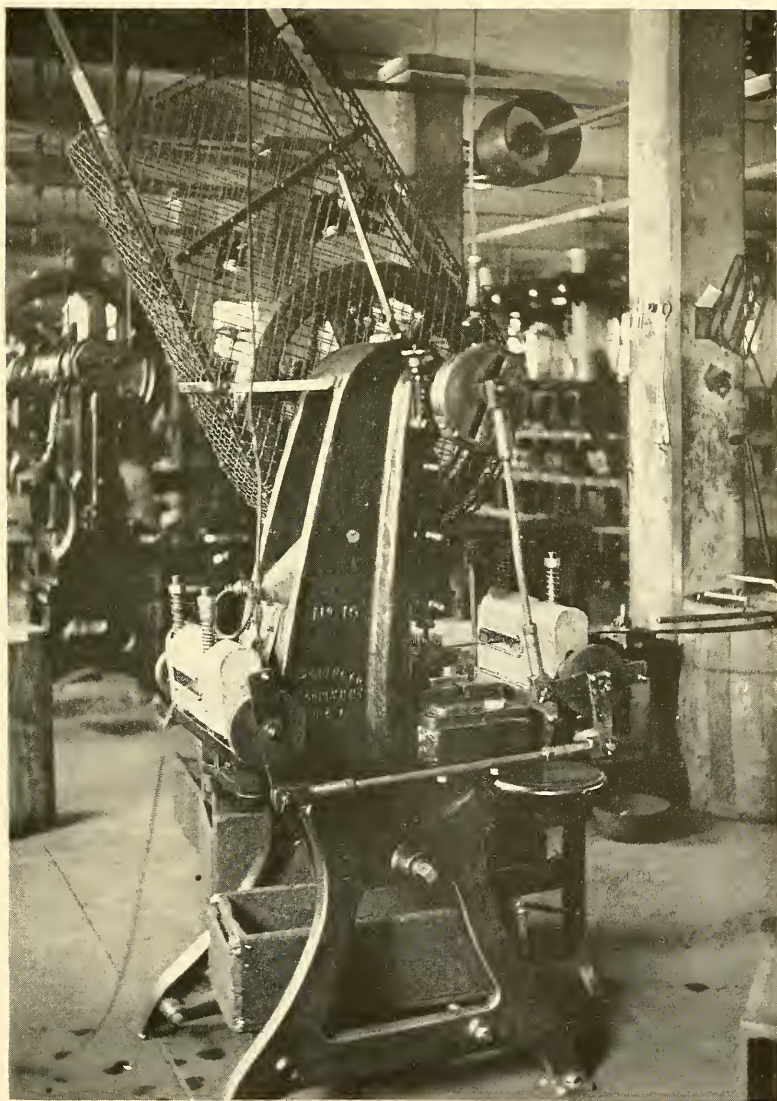


FIG. 7.

AMERICAN MUTUAL LIABILITY INSURANCE COMPANY.

In order that the members of the American Mutual Liability Insurance Company may obtain the benefits derived from conducting safe and efficient plants, this company maintains a Bureau of Safety that is constantly at the service of its insured.

The organization is composed of technically trained engineers, who have had several years of practical experience in the employ of various kinds of manufacturing establishments. Owing to the fact that the field covered by this company extends over the United States and Canada, it is possible to continually keep in touch with the most approved safeguards and methods of accident prevention that are continually being developed from time to time in various parts of the country. Co-operation is the keynote of success in safety. The exchange of suggestions and ideas that may be obtained from well-known safety organizations is invaluable, and our affiliation with the National Safety Council, American Museum of Safety, the Boston Safety Society and the New York Compensation Inspection Rating Board (through the American Mutual Compensation Insurance Company of New York) keeps our engineers informed of the latest ideas relating to safety evolved by our contemporaries.

No one engineer is assigned permanently to any district or section. For this reason each man has an opportunity personally to acquaint himself with the safest and most efficient methods that are being used by the manufacturers in all localities.

The intervals between inspections of plants vary for individual cases. The equipment and accident experience of some mills and factories demand more attention than others, and consequently no hard and fast rule is established in regard to the frequency of inspections that applies to all industrial establishments covered by our policies.

The safety recommendations which are submitted subsequent to inspections must, above all else, be practical. We firmly believe that in order to maintain the enthusiasm of the employer he must be convinced that "Safety First" does not necessarily call for expensive and impractical methods of safeguarding in his factory or mill, which will greatly impede the work, increase the cost of production, and at the same time show but slightly beneficial results from a safety standpoint.

Our safety engineers, through their own practical experience, appreciate most fully this all-important fact, and this is largely responsible for the welcome spirit shown in almost every instance by our members in regard to safety recommendations. It occasionally happens that there is a slight misunderstanding as to the purpose for which a recommendation is made, but in these instances the details are taken up most fully, and almost without exception we find that our recommendations are finally adopted as originally presented. If no reply is received

within thirty days after submitting recommendations, a letter is mailed requesting a report on the progress of the work involved. Close touch is kept with those who appear to be delinquent in this respect, until the entire list of safety suggestions is properly attended to.

We firmly believe in protecting machinery and equipment before it has caused an injury. This, however, is frequently impossible, and therefore a system is maintained whereby every accident in the plants which we insure is recorded. Each plant has a card of its own, subdivided into various well-known causes of industrial accidents, together with spaces for indicating accidents caused by special machinery. In this manner it is possible, before making a reinspection, to determine at a glance the hazards which have been causing trouble in the past, and special attention is given to these points by our engineers during their visit.

Blueprints, photographs and drawings are supplied where they would be helpful to the superintendents or master mechanics in carrying out the necessary items of safety work. It has always been found very helpful to have these safety recommendations explained personally to the superintendents and foremen. These men usually have the authority to insist upon the adoption and maintenance of proper safeguards, and if they can be made to see their practicability, the problem of having a safety rule enforced becomes a simple matter.

Efficient organization and discipline, with proper instructions to the employees, can accomplish more toward the reduction of industrial accidents than all the mechanical safeguards ever devised. A spirit of co-operation, fostered by the employer, which embraces the good will of the foreman and the employee can be reckoned as the greatest asset for safety. Our engineers — ever mindful of this fact — give valuable advice in organizing safety committees in the manufacturing plants, enlisting the interest and enthusiasm of the workers as well as the men higher up.

The appended photographs illustrate a few of the many safeguards which have been adopted subsequent to our inspections, and it will be noted that durability and simplicity of design, as well as non-interference with the efficient operation of the machines, are special features which characterize the safety recommendations submitted by the Bureau of Safety of the American Mutual Liability Insurance Company.

Fig. 8 shows how a boy's arm was lost on a mule spinning frame.

Fig. 9 illustrates same spinning frame shown in Fig. 8, with a guard in place which was designed by our engineering staff.

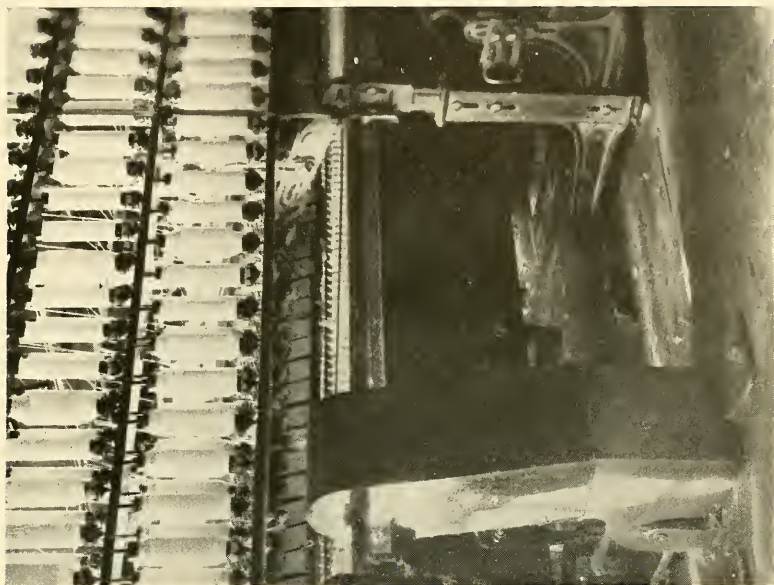


FIG. 9.



FIG. 8.

Fig. 10 shows tumbling barrel guard. The guard is operated in the manner of a roll-top desk. The tumbling barrel in the center shows the guard up, while the machines at either side show the guard rolled back in position.

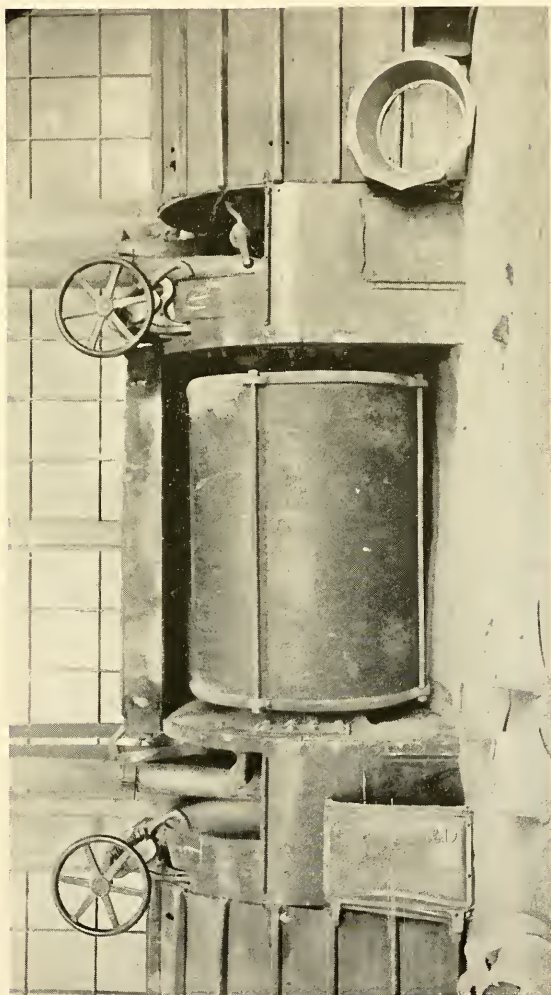


Fig. 10.

Fig. 11 shows substantial rail to protect dynamo pit. Note the concrete combing which prevents tools, etc., from falling into the pit.

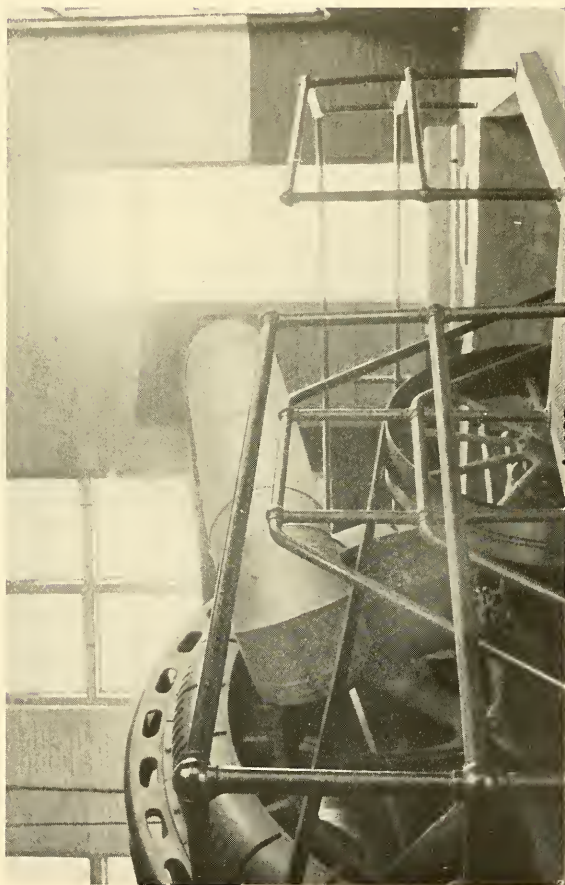


FIG. 11.

Fig. 12 shows overhead walk-way in boiler house. This does away with the use of ladders in an installation of upright boilers. Accidents in this boiler plant have been reduced to a minimum since the walk was installed.



FIG. 12.

Fig. 13 shows exposed bevel gears driven by water wheel.

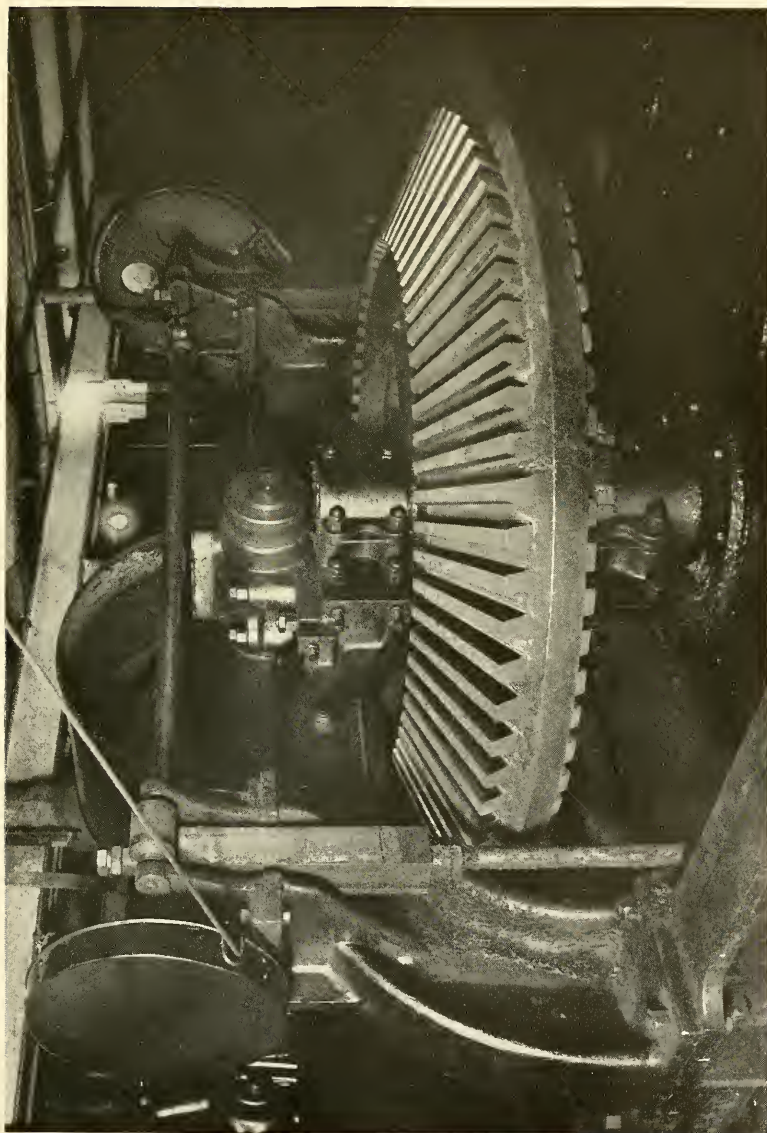


FIG. 13.

Fig. 14 shows water wheel gears shown in Fig. 13 after they had been guarded at the advice of our engineers. A guard of this type prevents the grease from spattering around the floor, and at the same time all moving parts are visible for frequent inspection.

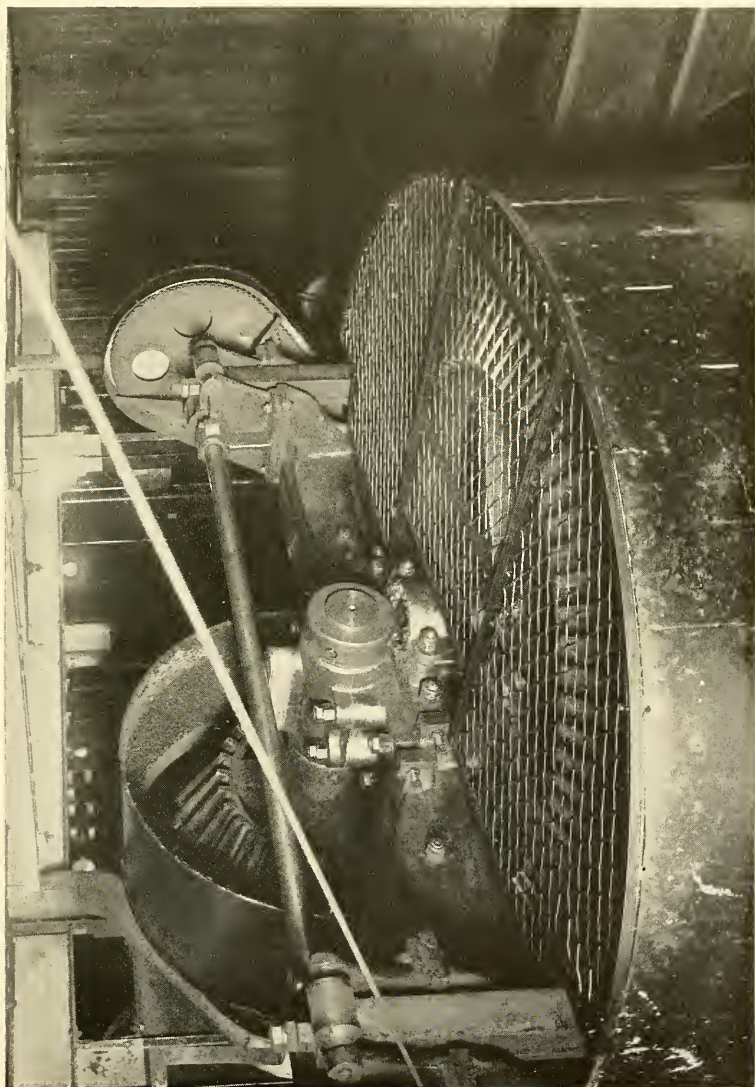


FIG. 14.

CONTRACTORS MUTUAL LIABILITY INSURANCE COMPANY.

The scientific treatment of the causes of industrial accidents, combined with uniform inspections and investigations as a factor in the operation of a liability insurance company, does not produce a direct measurable financial result. The economic and humane necessity of such work, however, is firmly established by the existence of the highly trained engineering and inspection departments of a majority of the liability companies.

The efficiency of "accident prevention" is not wholly measurable by the number of recommendations offered and adopted, nor alone by the decrease in the number of accidents, but rather by the decrease in the ratio of medical cost and compensation to the pay roll insured. Even this is not absolute, for the fluctuation of surgical expenses and the increased benefits recently created through amendments to the act must be given consideration in our final deductions. Unfortunately, our experience under the Workmen's Compensation Act is still so limited as to make deductions on this basis unreliable; and, for the time being, the best we can offer is a schedule of dangerous conditions rectified, as is submitted at the end of this report.

During the past year there have been many outside influences which have materially assisted the liability inspector. Various public and semi-public institutions have inaugurated campaigns of "Safety First" in the different cities and towns of the Commonwealth, and these campaigns have served to impress the idea of personal safety upon the minds of the average employee in a manner possible in no other way. In addition to this, our magazines and periodicals have given more and more space to this subject, and reach the reading public in an opportune time.

Such a campaign has had remarkable results, and the liability inspectors are encountering these results in the increased receptiveness to their suggestions in the industrial operator and the employee. The employer is realizing that accidents affect the moral tone of his organization and his own business and social standing in the community; and the employee is appreciating the fact that his long and successful experience in his own particular trade does not guarantee him against accident during his working hours.

Many new conditions of law have been created during the past year, materially affecting the conditions of industrial operation. One of the most important of these is the new regulations concerning the operation of elevators, and the inspection department of this company has already outlined these new requirements to a large number of its policyholders, aiming to keep its clients fully advised as to their legal responsibilities.

In considering the work of the inspection department of this company one must comprehend that our working conditions are materially different from those of the average liability inspector who is called upon to rectify what are principally permanent conditions as encountered in shops and factories, and which conditions, once corrected, remain so indefinitely in the majority of instances. His principal concern is then to watch for mechanical changes and for whatever tendency there may exist to neglect the use of the installed guards. In our class of risks conditions are constantly changing. Often a dangerous condition is created, seen by the inspector and rectified, and then entirely removed before the inspector has had time even to render a report on the matter. A small risk is liable to be just as dangerous as a large one, and requires the same efficient supervision. In other words, the nature of the majority of our risks is such as to demand constant inspection and exceptional training of the inspectors. Another factor of our inspection work, and one which is quite important, is that the inspector is in many cases the connecting link between the management of the company and the policyholder, and he is called upon to outline the practical application of the act and answer innumerable other inquiries along insurance lines. The satisfaction of the policyholder and the efficiency of the work may be measured by the attitude and bearing of the inspector as he makes his investigation.

The inspection department is planning still greater activity along the lines of its endeavor. Each inspector is supplied with a loose leaf book in which there are mounted cuts of the available practical machinery guards, together with the cost, name of maker and the address of the local agent. These books are kept up to date as rapidly as the practicability of the new devices has been proven. These have recently been supplemented by similar books in which there are mounted representative photographs of dangerous conditions rectified, and machinery guards installed. Tangible evidence of industrial accidents, broken parts of machinery, improper tools, broken cables, bolts, etc., are secured and filed in the office. Photographs are taken of these and used in the inspector's collections. This branch of the work will be further developed during the coming year, as it has been found to be the most effective manner in which to establish the practicability of the suggestions offered.

The following schedule of dangerous conditions encountered by the inspectors of this company will be of interest, and a number of photographs are submitted as being unusual:—

Synopsis of Recommendations, Inspection Department.

Relative to the use, handling and storage of explosives,	14
Guarding driving belts and pulleys,	173
New hoist lines on derricks and cranes,	13
Other parts, etc., of derricks and cranes,	60
Relative to dust conditions,	7
Relative to dumping of refuse material,	2
Relative to elevator gates or bars,	31
Relative to elevator cables,	4
All other elevator conditions,	92
Guarding of emery grindstones,	75
All other conditions relative to emeries,	22
Relative to conditions of equipment,	29
First-aid conditions,	11
Construction, guarding, etc., of footways,	142
Guarding gears,	164
Relative to the use of goggles or glasses,	59
Various instructions to employees,	31
Projecting keys,	24
Broken ladders,	36
All other ladder conditions,	102
Guarding moving parts of machinery,	93
Relative to projecting nails,	95
Guarding floor openings, lofts, stair-wells, etc.,	119
Jointer and planer guards,	64
Unwarranted public conditions,	14
Shoring of buildings and trenches,	4
Improper shipper bars,	6
Guarding of bench and band saws,	159
Projecting set screws,	155
Guarding shafting,	27
Unsafe and improper conditions of stairs,	121
Improper staging construction,	35
Providing stagings with rails and toe boards,	107
Other staging conditions,	9
Relative to the storage of stock, equipment, etc.,	40

Posting notices of insurance and doctor's notices,	206
Relative to all other notices,	82
Relative to the use of screens,	7
Industrial track conditions,	7
Relative to wagons and harnesses,	4
Guarding electrical equipment,	5
Miscellaneous recommendations,	14
<hr/>	
Total,	2,464

Fig. 15 shows mason's staging provided with rails and toe boards.

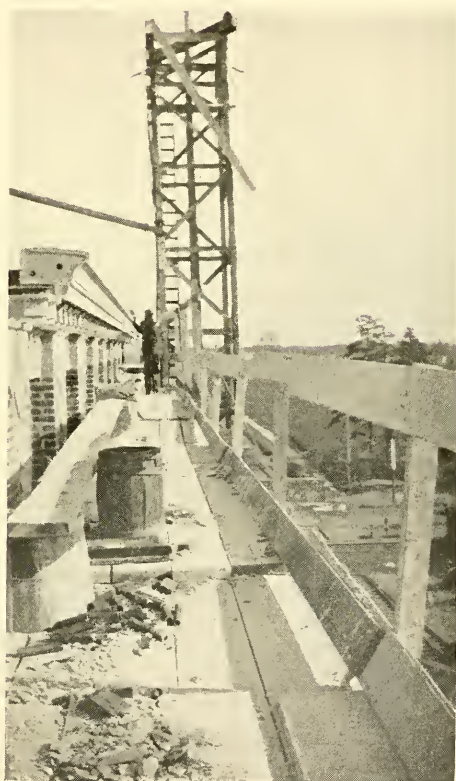


FIG. 15.

Fig. 16 shows metal guard for the eccentric of an iron cut-off and individual control through clutch on countershaft. Control was formerly inside of the building.

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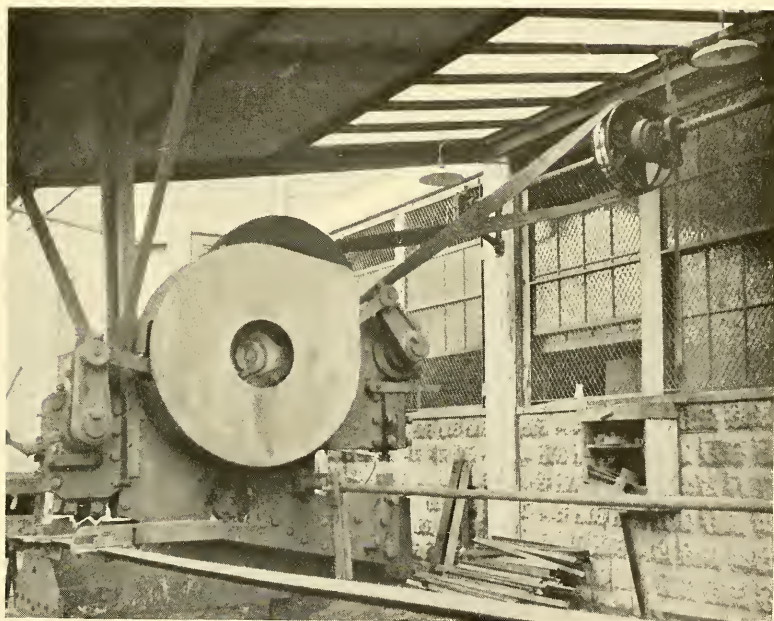


FIG. 16.

EMPLOYERS' LIABILITY ASSURANCE CORPORATION, LTD.

Accident prevention work has been carried on by the Employers' Liability Assurance Corporation, Ltd., for many years. At first it was undertaken principally to improve conditions in connection with hazardous risks, but later, as legislation was enacted to prevent injuries and punish those responsible for their occurrence, this company kept pace with it, and has made every effort to attain this humane end which experience has shown to be so closely allied with good liability underwriting principles.

A large number of experts are employed constantly in studying to prevent accidents whose causes have been recognized, and to remedy conditions which are recognized by trained men as likely to cause accidents. All serious accidents are reported to the inspection department by the claim department, and steps are immediately taken to prevent a recurrence of such accidents.

For several years past this corporation has engaged in steam boiler insurance, and inspections have been made, as required, by men who are specialists in their particular line. Factory machinery and elevators are also inspected in a most thorough manner by experts who specialize in these fields.

During the first six months of this year the total number of boilers examined was 2,360. Of this number, three were condemned and removed from service; 1,124 specific defects, ranging from the most minute to the more serious, were discovered and called to the attention of the assured, all of which have been corrected.

In the period referred to 3,869 factories were inspected. A total number of 3,883 defects were discovered and called to the attention of the assured, and we have been notified that they have been remedied.

Elevators numbering 5,404 were inspected during this period, and 3,474 defects were discovered. Immediate action was taken to insure the safe operation of these machines.

With regard to the general matter of elevators we are of the opinion that the new statute and the rules adopted by the Elevator Board, which are now in force, will have a marked effect in insuring the safety of property and persons.

Every effort is being made by this corporation to see that not only the spirit but the letter of the statute and rules of the Board are complied with by those whose elevators are insured and inspected by this corporation.

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK.

The Fidelity and Casualty Company of New York has constantly in view the necessity of eliminating, as far as possible, unnecessary hazards encountered by workers in the industrial field; and it endeavors, through the agency of its inspection department, to improve

conditions for the good of the workers, as well as for its own interests and for the interests of the employers. It recognizes that the State's duty to conserve the working power of its citizens is concerned primarily with the proverbial ounce of prevention, and that in the broad field of accident prevention and disease prevention in the industrial work lies one of the great divisions of that duty.

In the furtherance of the State's object, insurance companies have large opportunities for doing good work that coincide with the best interests of the insurance business. By suggestion and direction regarding the bettering of working places and conditions, the use of machinery guards, and the installing of ventilating systems the Fidelity and Casualty Company endeavors to prevent the sacrifice of the life, limb and health of the worker to industrial diseases and accidents.

The war on consumption is waged vigorously because of the world's realization that its prevention is not only possible but also an economic necessity. The industrial world must be brought to a similar realization regarding industrial diseases and accidents in order that the war against the economic waste caused by those evils may be waged with equal vigor.

The company is a subscriber to the standard magazines devoted to machinery, and is a member of the American Museum of Safety of New York City and the National Council of Safety in Chicago, and its representatives attend all conventions where safety and welfare work is discussed. Large quantities of literature on the subject of safety devices are distributed to employers by inspectors as a part of the company's campaign of education on the subject. The company thus keeps in touch with the latest and best practices and methods, and makes every effort to keep its inspectors and its assured fully informed on the subject of safety appliances and methods approved in welfare work in general.

The work of the inspection department is closely related to the work of the various departments of the company from which it obtains valuable information and experience for the instruction of its inspectors. The inspections are made systematically and thoroughly, and detailed reports rendered in a form calculated to present a clear picture of the working conditions, hazards and defects. The reports cover the condition of the assured's premises, plants, machines, tools, fire protections and the nature of the work of the employees; and in the case of plants more than ordinarily dangerous, special inspections are made, if necessary, the inspector being accompanied by experts in the particular lines involved. Such inspections are made the subject of special reports.

The collection of this detailed information is not left to the judgment of the individual inspector, but so far as possible the inspector is guided by a comprehensive report form containing some two hundred points to be covered, thus enabling the inspector to report on all or-

dinary conditions and also on extraordinary conditions requiring special attention and treatment. This systematic method of inspection, without restricting the expert inspector, renders the report accessible for reference and classification in conformity with standard rules, conditions and requirements in accordance with State laws.

All defects found on inspection are brought by the inspector to the attention of the employer, and also to the person in charge of the premises inspected, and recommendations and suggestions are carefully explained and discussed in order that the employer may have a clear understanding of the danger of the defects, and of the best method of correcting them.

The report of each inspection when received at the home office is carefully considered and checked, and written recommendations and suggestions are thereupon forwarded to the employer. It is obligatory that the employer should comply with the recommendations, but suggestions are optional.

The company's book, "The Prevention of Industrial Accidents," has run through several editions aggregating 70,000 copies. The last edition of 10,000 copies is now being distributed. Copies are distributed free, unless requested in large quantities, when a charge is made to cover the cost of printing. The book in its 200 pages covers such subjects as "Care on the Part of Employers and Employees;" "Safety Devices;" "Wood-making Machinery;" "Steam Boilers;" "Engines;" "Electrical Apparatus;" "Elevators;" "Factories," etc.

Under the title "Steam Boilers," a code of practical rules, submitted to the American Society of Mechanical Engineers by that society's boiler code committee, has been added to the latest edition. In addition to this work the company has prepared and printed over 20,000 copies of two pamphlets, "Fly-Wheel Explosions" and "Steam-Boiler Explosions."

The company also publishes a monthly bulletin of general information for free distribution; and with each publication prints a list of boiler, elevator and flywheel accidents. Each list covers a period of one month, and gives the place of the accident, such as the city and State, the premises where the accident occurred, the nature of the accident, the number of persons injured, the number of persons killed and the amount of property damage.

"Rules for operating Steam Boilers" is another publication of the company. This publication, together with the "Rules, Requirements and Universal Safety Standards" of the department of accident prevention, inspection and merit classification of the Workmen's Compensation Service Bureau, is a very effective means of assisting the owners of factories and their workmen. The company has also purchased and distributed a large number of copies of "First-aid Instructions for Miners," published by the Department of the Interior, Bureau of Mines.

The company, in addition to all the literature described, prints speci-

fications and directions for installing boilers, and passes upon plans of boilers, flywheels, elevators and machines.

The company's policy regarding safety devices is to maintain standard conditions, and with that end in view to co-operate with others interested in the same work. Safety devices are judged by the inspection department on the basis of weight, price, mechanical strength, permanency, ease of adjustment, freedom from interference with the work, ease of inspection and the effect on the output, which should be increased and not decreased. It will be seen from what has been stated that the ultimate aim in each case is to secure the maximum safety for the employee, with economy and efficiency for the employer. The company is in hearty sympathy with the suggestion that all safety devices should be passed upon by the casualty council of the Underwriters' Laboratories, and is in full accord with the increasing demand for uniform laws in all the States.

The company's inspectors are all mechanics who have had experience in some mechanical trade, and are, by training, machinists, electricians, boiler makers, elevator makers, steam or marine engineers. As they are employed, and before they are allowed to make inspections, they are given a three months' course of instruction at the home office. This course includes visiting the American Museum of Safety and inspecting large plants under the guidance of a regular inspector, checking reports, observation work in an engine room, operating steam boilers, engines, dynamos and elevators. The inspectors are required to co-operate with State inspectors and with inspectors of other companies, and to permit no violations of the law and no failures to comply with standard practices. Men with such mechanical knowledge and training, instructed and supplied with data from all available sources, may be relied upon not to compel an employer to install a guard that is not practicable, and will not fail to show an employer how to install a suitable guard.

The following list, containing a summary of inspection reports on certain specified points, is an illustration of the company's work: —

DEFECTS NOTED IN THE INSPECTION REPORTS, MASSACHUSETTS.

The Fidelity and Casualty Company of New York, January to November, 1914.

Defective pressure gauges,	15
Defective settings,	8
Defective rivetings,	5
Defective water gauges,	25
Defective and unprotected blow-off pipes,	36
Defective feed pipes,	22
Defective heads,	2
Defective patches,	9
Defective safety valves,	27
Overload safety valves,	13
Safety valves of insufficient area,	7

Internal corrosion and pitting,	74
External corrosion and pitting,	22
Broken and loose stays and braces,	6
Cases of sediment and deposit,	19
Cases of scale and incrustation,	73
Furnaces out of shape,	101
Burned plates,	1
Bagged plates,	14
Cracked plates,	13
Serious leakage at tube ends,	61
Serious leakage at seams,	23
Boilers without pressure gauges,	2
Boilers without water gauges,	3
Unclassified defects,	65
Dangerous belts,	28
Dangerous gears,	9
Dangerous machines,	33
Dangerous stairways,	24
Dangerous hoistways,	3
Dangerous openings,	2
Dangerous shafting and transmission,	5
Dangerous material,	2
Defective light, order and sanitation,	5
Dangerous explosives,	1
Dangerous elevators,	15
Dangerous grinders,	7
Dangerous boilers,	0
Dangerous tanks,	1
Fire dangers,	9
Defective tools,	0
Defective floors,	5
Dangerous safety and welfare conditions,	3
Dangerous windows,	1

THE FIDELITY AND DEPOSIT COMPANY OF MARYLAND.

The Fidelity and Deposit Company of Maryland recognizes the great importance of the subject of accident prevention, and is giving careful attention to this essential feature of the liability and compensation business. The company maintains an inspection and accident prevention department, which has more than doubled in size in the past eight months, and through the agency of an efficient corps of inspectors every effort is being made to prevent the occurrence of industrial accidents and to give our policyholders the best possible service. The Standard Dictionary defines inspection as the art or process of looking into, especially a careful, critical investigation or scrutiny. It is our opinion that there is no business wherein there is a more urgent demand for a careful, critical investigation than there is in the business of insurance.

The men employed by this company as inspectors are selected according to their experience in a special line. It is the aim of this department to secure the services of men who are specialists in the respective lines written by this company.

For the purpose of systematizing the work a resident inspector is

stationed in the principal cities throughout the country, and through them the inspection work is carried on. At the present time two inspectors are located in Boston, Mass., six inspectors are attached to our New York branch, one inspector is attached to our Philadelphia branch, two inspectors are attached to the home office in Baltimore, one inspector is attached to the Pittsburg branch, one inspector is attached to our office in Detroit, one in Milwaukee, one in St. Louis, one in San Francisco and one in Los Angeles.

Risks inspected by the Fidelity and Deposit Company of Maryland are classified as follows: elevators, employers' liability, compensation, contractors', owners', contingent and general liability. The frequency of inspection is governed by conditions. For example, it is sometimes found to be advisable to place an inspector on a contractors' risk until the contract is completed. Ordinarily, elevators are inspected every three months, employers' liability and compensation risks every six months, general liability once yearly, and contractors' risks as often as the nature of the work demands.

In order that our inspectors may be kept thoroughly informed as to the best means of carrying on their work successfully they are advised of the most approved methods of safeguarding through various agencies; for example, through the National Council for Industrial Safety, which is recognized as one of the most important agencies in this country working on the prevention of industrial accidents; through the distribution of safety literature from various manufacturing concerns; and third, through the subscription to magazines devoted to the subject of accident prevention, such as "Safety Engineering."

One of the most important features of our work is the careful study of the causes of accidents which are reported. Our inspectors are kept informed of the occurrence of all accidents in their respective territories, and each accident is made to serve as an object lesson. In this manner our men are educated to recognize the preventable conditions which cause accidents.

No inspection is considered complete unless the recommendations made by our inspector are explained to the entire satisfaction of the assured or his authorized representative. We feel that too much importance cannot be given to this feature of the work, inasmuch as it has been our experience that there are, comparatively speaking, few of our policyholders who are not willing to comply with our recommendations, provided they are made in a clear and logical manner, and provided our inspector can satisfactorily prove the necessity of making the changes he recommends. We may state in addition that our inspectors are instructed that their recommendations must be reasonable and practicable. Unnecessary recommendations are not encouraged.

At the present time about 3,000 inspections are being made monthly by the Fidelity and Deposit Company of Maryland. From June 1, 1913, to May 31, 1914, a total of 28,328 inspections were made. These

resulted in 24,903 recommendations to our various assureds for the improvement of conditions in their respective plants as regards safety. In the State of Massachusetts alone, from June 1, 1913, to May 31, 1914, a total of 2,046 inspections were made, which resulted in a total of 1,046 recommendations. These recommendations are divided into the following classifications: dangerous elevator defects, ordinary elevator defects, other dangerous defects and other ordinary defects. Of the first-named necessary recommendations, 100 per cent. are complied with, and it is closely estimated that 70 per cent. of the desirable recommendations are likewise given the necessary attention by our policyholders.

After the inspection is made and the recommendations explained to our assured's satisfaction the report of the existing conditions in the plant is forwarded to the home office, and a letter is promptly written to the assured, listing in detail the suggestions made by the inspector, explaining the necessity of making the changes, and containing a request that the policyholders give them careful consideration. If the assured feels that the recommendations are uncalled for, or if he is not satisfied with the reasons advanced for advocating the changes, the inspector is detailed to visit the plant again, or as often as is necessary, in the endeavor to point out why it is necessary to make the changes requested, and how similar conditions have been the cause of injuries elsewhere. The company's inspectors are always at the service of the policyholders, to give them every aid in carrying out suggestions which have been made for the betterment of conditions in their respective plants.

Accidents may be assumed to result principally from four causes: first, the risk inherent to the particular line of work; second, carelessness; third, the unguarded condition of dangerous machinery; fourth, undue speed in trying to increase output. The first-named cause cannot be obviated; the second cause can only be overcome by educating to "Safety First;" the third-named cause can be corrected largely by the use of proper safeguards; the fourth, by intelligent superintendence to increase the output only to a point that is consistent with safety.

The safeguarding of machinery is undoubtedly an important feature of accident prevention work. Efficiency has been one of the greatest developments in recent years. This means the utilization of all energies without any wasted movements, and the elimination of unnecessary efforts from the task to be accomplished. It is most indispensable to modern efficiency that any dangerous points about the machinery should be fully protected, in order that the operative may be as free as possible from all thought of danger and devote his best energies to the work. However, from the standpoint of accident prevention it is estimated that not more than 35 per cent. of the accidents occurring can be prevented by the use of safeguards alone. One of the most important, if not the most important, feature of accident prevention work is in

securing the proper co-operation between the employer and the employee in a campaign of "Safety First." Safeguards are of little use unless the men required to use them are interested in their success, and it is the opinion of this department that more actual good can be accomplished by interesting employees in the subject of accident prevention than by any other means. At the present time this department is endeavoring to make special effort to interest our policyholders in this feature of accident prevention. This educational campaign can best be carried on by the organization of safety committees among the workmen and the co-operation of the management with their efforts.

A great many manufacturing concerns have made marked reduction in the number of accidents to employees, and they attribute their success to educational methods and to the use of guards. It is a fact that some of the most practical recommendations for the safeguarding of dangerous machinery come from the employees.

The greatest influence in the work of accident prevention, and the factor which has been instrumental in giving this important work the consideration it deserves was the formation of the department of accident prevention, inspection and merit classification of the Workmen's Compensation Service Bureau. The system which has been adopted is the only one of its kind in successful use at the present time which offers to the manufacturer a definite and specific premium for the proper protection of his employees. The Universal Analytic Schedule for the Measuring of Relative Work Accident Hazards is the system referred to. Since this schedule was adopted on Dec. 12, 1913, inspections have assumed more importance than ever before, and the prevention of industrial accidents has become a necessity to the employer who wishes to pay the minimum premium allowed on his line. The subject of accident prevention is now being standardized, and those policyholders who comply with the recommendations made by our inspectors in accordance with the standards compiled by the department of accident prevention, inspection and merit classification make an investment which will bring them good returns. It should also be remembered that when the employer of labor is safeguarding his employees he is also increasing the efficiency of his plant. What this will amount to in increased output we cannot say, but it is a fact that accident prevention is the greatest efficiency measure that has ever been advocated.

With this report the Fidelity and Deposit Company sent several pamphlets on the different phases of accident prevention, such as the safe management of elevators, the reduction of accidents in manufacturing establishments, instructions to foremen, etc., and a number of warning signs for use in dangerous work.

Fig. 17 shows flat-work ironer or mangle with gears entirely encased and with an automatic guard in front of the rolls which positively prevents the employees from getting their hands mashed. The slightest push on this guard will automatically throw the circuit breaker and stop the rolls from revolving.

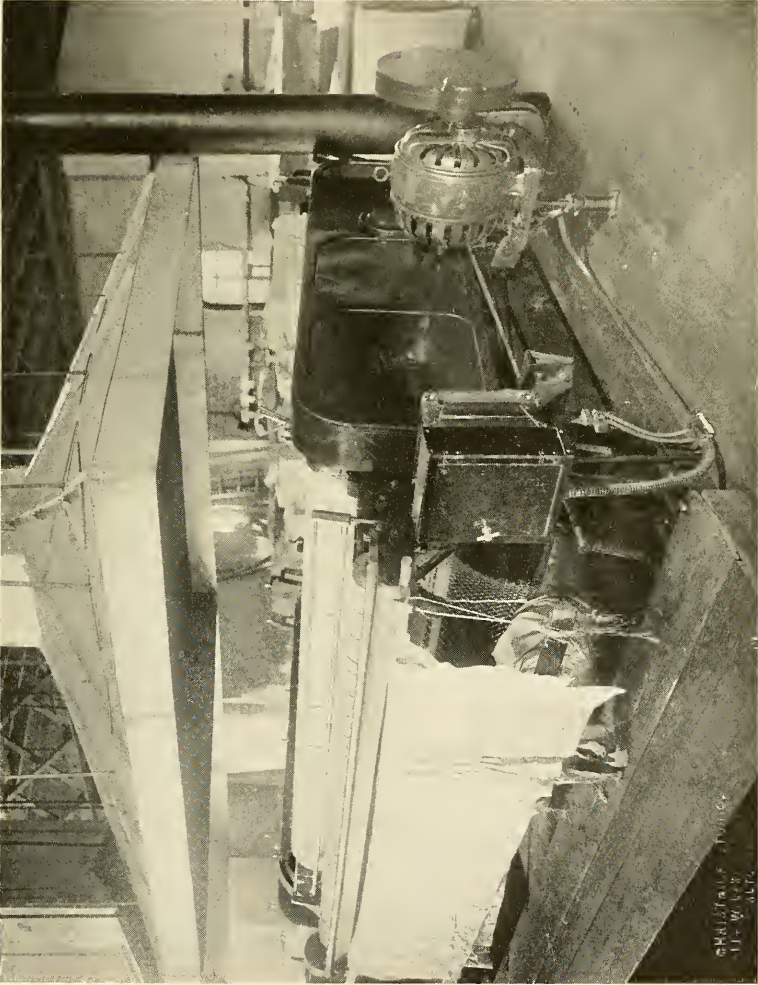


Fig. 17.

Fig. 18 shows collar and cuff ironer with automatic guard shown in Fig. 17.

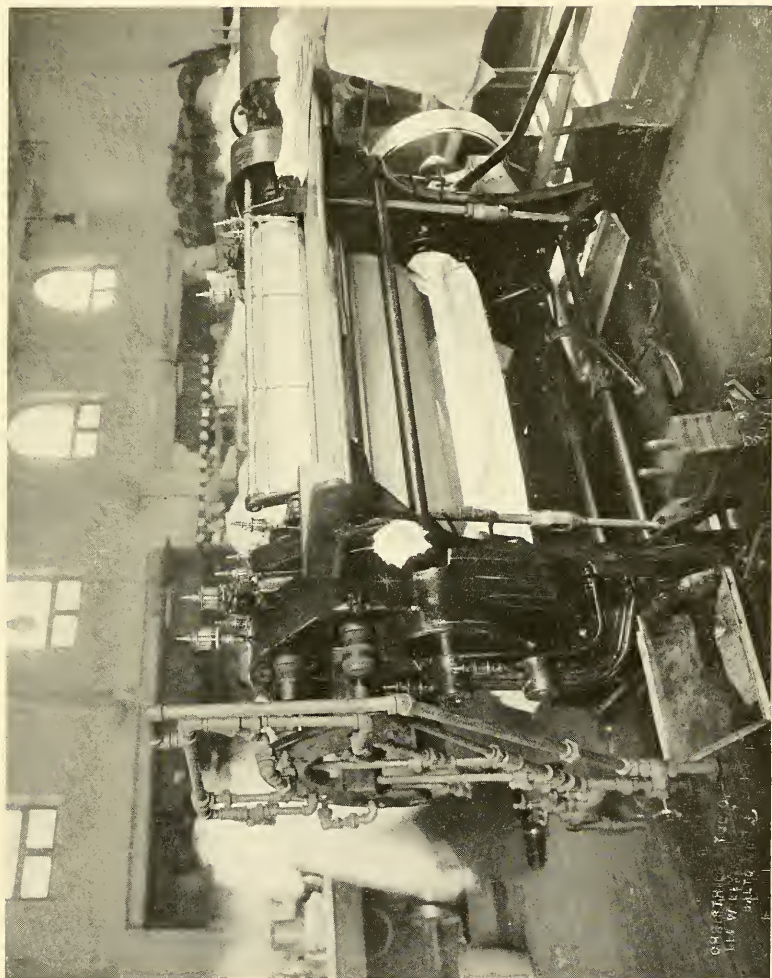


FIG. 18.

Fig. 19 shows printing press with gears encased and with a wire mesh guard in front of the flywheel and belt.

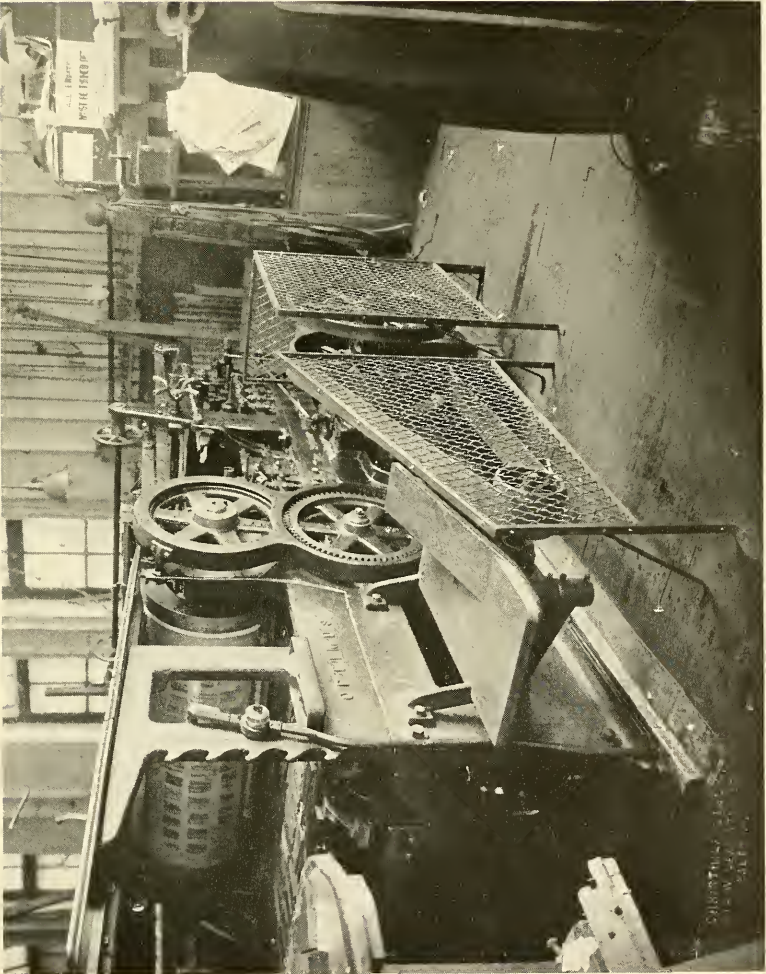


FIG. 19.

FRANKFORT GENERAL INSURANCE COMPANY.

The Frankfort General Insurance Company maintains an inspection department for the benefit of its policyholders, to regularly inspect all risks insured and recommend such improvements as are necessary for the safety of the employees in manufacturing plants. The best experienced elevator constructors are employed for the sole purpose of inspecting all types of elevators and giving our assured the best service that money and experience can get. This gives the public as well as our policyholders assurance of expert advice.

Our inspection department does not recommend any one type of safety device for any type of machine, but the inspectors are competent to suggest such guards to be installed on machines as will best suit the work, and we send to our assured pamphlets describing the various guards manufactured and where they can be obtained.

In addition to our regular inspection work we are investigating as many machine accidents as practicable, studying the machine, the cause of the accident, and suggesting such guards or safety devices as will prevent the recurrence of the accident, and using the experience thus gained in the general inspection work.

The enactment of the compensation laws in various States, and the requests for merit-rating inspections, has more than doubled the cost of inspection work, for in order to properly rate a risk the manufacturing plants have to be inspected to ascertain the actual conditions. Then these plants have to be reinspected in order to allow the assured the proper credit or rate reduction, and probably, to allow the assured the proper reduction, a plant may have to be reinspected three or four times before all improvements that were recommended are completed.

During the year ending June, 1914, the inspection department of the Frankfort General Insurance Company made 14,378 inspections, with a total number of defects found of 38,940. The total number of defects uncompleted at the end of the year was 2,476.

We trust that this brief outline of our work will prove of interest. The safety-first movement, now national in its scope, has our most hearty support. The "Frankfort's" efforts in trying to reduce accidents are made not only from the financial standpoint, but more from a humanitarian standpoint.

GENERAL ACCIDENT FIRE AND LIFE ASSURANCE CORPORATION,
LTD.

The General Accident Fire and Life Assurance Corporation, Ltd., first took up the matter of accident prevention in the Commonwealth of Massachusetts in July, 1912. Previous to that time we had been inspecting our elevators in a regular manner at quarterly intervals, but the question of inspection of factory and contractors' risks, etc., had not been seriously gone into. It might be well at this point to explain the home office organization under which our safety engineer in charge of the Massachusetts work operates. There is at the head of the department a chief engineer who has been with the corporation over eleven years, assisted by a supervisor of inspections who has been with us over nine years, which would indicate the experience at the command of the policyholders of this corporation. There are also assistant engineers at the home office, and every report received there is carefully scrutinized by experts, and the defects analyzed in order that the assured may receive the best advice possible with regard to economically eliminating the dangers existent in their plants as disclosed by our inspection.

In the field there are established supervising inspectors in charge of large districts in the west, under whom many expert mechanical and safety engineers work, and in the more important smaller districts in which technical expert experience and education should be centered a competent safety engineer is permanently assigned, as is the case with Massachusetts, all of whom work in close co-operation with the home office. The latest publications in "Safety Engineering" are furnished gratis to our engineers and inspectors, and every effort is made to keep them up to date as regards the progress of the somewhat new although very intricate profession of safety engineering.

Our field force is also being constantly and carefully educated in the important part that the employees and subforeman bear with regard to accident frequency, and in plants where mechanical safeguards seem to have been completely installed, and yet the accident frequency is high, we are prepared to study the conditions, and in many cases have offered suggestions relative to slight changes in the process of that particular factory which have resulted in a material reduction in the accident frequency. This feature is also carefully considered, in that our claim department advises the engineering department of all accidents happening in mechanical plants, and these notices of accidents are immediately transmitted to the engineer in that district, who visits the plant and studies the scene of the accident. In many instances we have been able to offer suggestions which have prevented a repetition

of that accident, and which also have led to the prevention of similar accidents. We do not at the moment work on any basis of detailed, standardized safeguarding, although we approve of the standardized guards as considered from a standpoint of guarding machine tools and other machines before the same leave the manufacturers' hands. It is a regrettable fact that safety work has been and is being recommended to different factory owners by various organizations, in which the processes of guarding as advised are considerably more expensive than perhaps further study might have indicated as being necessary. It is the constant study of the engineering department of this corporation to produce designs for guards and suggestions for methods of operation in factory plants which, while highly efficient from a standpoint of safety, do not interfere with the efficiency of the machine operations nor incur burdensome expense upon the assured. With regard to the elimination of danger points in the plants of our assured we feel that each plant is a problem unto itself which should be solved by study, rather than by attempting to have installed some guard as pictured in a book which might have been efficient in some other plant.

In the Commonwealth of Massachusetts every compensation risk which may be included under the term of a manufacturing plant is thoroughly and carefully inspected immediately before or immediately after our insurance becomes effective. Suggestions and recommendations are offered the assured for the elimination of dangers as disclosed by such inspection, and, if necessary, sketches, blueprints or photographs of safety devices and methods of safeguarding the particular machines in that particular plant are furnished gratis to the assured. In cases which occasionally arise, wherein a machine or a condition of manufacture in a certain plant may seem difficult to safeguard, a drawing is made or a photograph taken and submitted to the home office for consultation by the experts there, and the problem solved and directions for the elimination of the danger sent back to the safety engineer at Massachusetts, who in turn takes up with the assured this matter and offers our advice.

Contractors' risks are carefully examined and recommendations made for the safeguarding of the employees, and particular attention is paid to the safety of the public who must use the adjacent ways for traffic. Many interesting problems of construction have been solved from photographs submitted to the home office, and recommendations made to the contractor for a change of methods which undoubtedly have prevented many accidents.

General liability risks covering mercantile buildings and dwellings are carefully inspected with regard to the conditions of the sidewalks, stairs, halls, ceilings, roofs, signs, outside lights and every other detail which might possibly cause an accident, and complete recommendations

made to the assured for the elimination of such danger points as may develop.

As a general rule, all recommendations are followed up in a systematic manner through the mail, and after due time another visit is made to investigate the progress of the work of safeguarding, and in many cases to confer with the assured as how best to perform the work. All of our elevators are inspected systematically, as are the elevators found in manufacturing plants. Questions of capacity and changes in the equipment are submitted to the men on our staff who have had long experience and actual practice as elevator constructors, and as a matter of fact, we pride ourselves in having on our staff some of the very few real old-time elevator constructors, as these men are very scarce at the present moment.

GLOBE INDEMNITY COMPANY.

For over two years the members of the inspection department of the Globe Indemnity Company have been engaged in a campaign for the improvement of danger conditions in all plants which we insure, and our safety engineers are devoting all of their time to cases of this kind.

We have met with exceptional success in eradicating danger points, and we find that our clients, in many cases, appear to be more than willing to accept advice which they formerly rejected, and some of them have gone so far as to take the initiative and request extra inspection service. We find a great many cases where State safeguarding requirements have been complied with, but as these do not conform with the standards which we have adopted, we strive in each case of this kind to have our assured make such alterations or additions as will bring the safeguards in question up to our standards, and I am pleased to inform you that we are meeting with much success along the lines indicated.

A number of instructive articles have been prepared for the benefit of inspectors in the field on such subjects as "Workmen's Refusal to Use Safeguards," "Factory Conditions and Employment of Unskilled Labor and Minors," "Danger Points in Power Transmission," "Hazards Incidental to Construction of Buildings," "Electricity and Its Hazards," "The Boiler Room and Accident Prevention," "Safeguarding Elevator Operation," etc.

The company has also been distributing recently among the inspectors, agents and policyholders a pamphlet on safety organization and the prevention of accidents, with a view to the betterment of existing conditions.

HARTFORD ACCIDENT AND INDEMNITY COMPANY.

This company actually began business in Massachusetts about the 1st of January, 1914, having reinsured the compensation business of the American Fidelity Company, Montpelier, Vt., so that our experience as regards Massachusetts compensation cases is naturally limited.

Immediately on assuming the business we started a plan whereby each risk was inspected by a competent inspector, and a formal report of the risk submitted by the inspector to the home office of the company. This report described the physical condition of the risk and the inspector's suggestions as to repairs, changes and the installation of possible safeguards tending towards an improvement of the risk, so as to guard as far as possible against accidents to the employees. Each new risk assumed is inspected as soon as possible, and a report of defects found by the inspector is made to the employer, with the request that any suggestions made by the inspector be followed, and that they report to us as soon as the suggestions have been complied with.

In the majority of cases we find that employers are willing and anxious to follow the inspector's suggestions in order to minimize the possibility of accidents to employees.

"Warning" signs are furnished by us to be posted on or near machines on which accidents are likely to occur, calling attention to the guards furnished and the penalty for failure to use same.

Each accident reported to the company is carefully looked over with the idea of suggesting improvements whereby a repetition of the accident may be avoided; and where machinery is involved, or poor light is the possible cause, an inspector is detailed to look over the scene of the accident and endeavor to suggest a safeguard to avoid a recurrence.

We believe that by following the above plan we have to a certain extent kept down the number of accidents, but find that there is still considerable work to be done by the inspection department, and the hearty co-operation of the employees themselves to be obtained.

LONDON GUARANTEE AND ACCIDENT COMPANY.

The London Guarantee and Accident Company at this time employs two inspectors who work exclusively in Massachusetts, with headquarters at Boston, making elevator, factory and premises inspections. During the year ending June 30, 1914, we made inspections of 537 factories and premises, making a total number of 617 suggestions and recommendations for the safeguarding of machinery and appliances.

and upon reinspection our records show that 89 per cent. of the suggestions made by our inspectors were carried out. We are at the present time carrying about 600 elevators throughout Massachusetts, and on the large majority are making inspections four times a year. Our records show that for the year ending June 30, 1914, we have made 1,700 elevator inspections. We have had no trouble in getting the assured to carry out the suggestions for the safety of the elevators.

THE MARYLAND CASUALTY COMPANY.

The inspection work of the Maryland Casualty Company has been carried on along lines similar to those mentioned in our former report to your Board.

We endeavor at all times to keep our inspectors posted in regard to the latest safety devices on the market, and circulars pertaining to same are forwarded semimonthly.

We inspect a great number of the plants in Massachusetts at intervals of three months, others at intervals of six months, and where conditions, according to the inspectors' opinions, justify it only a yearly inspection is made.

During the past year we have distributed a large number of copies of the "Rules, Requirements and Universal Safety Standards," published by the Workmen's Compensation Service Bureau in New York. These were sent to our inspectors and representatives, as well as to our assured throughout the entire United States. A new edition of this book is now in print which shows 300 cuts on the subject of safeguarding. As this edition will set forth the latest and best thoughts at present available on accident prevention, we consider this an effective way of obtaining results.

A separate department has been started in the past year for checking up accidents and investigating the cause of each individual accident and the means whereby a recurrence of same can be prevented. This department has in the past year experienced a more co-operative spirit on the part of the public towards the elimination of dangerous conditions than in the past.

MASSACHUSETTS BONDING AND INSURANCE COMPANY.

The Massachusetts Bonding and Insurance Company has established an engineering department of carefully trained experienced inspectors who give special attention to the inspection of risks for the minimizing of accident frequency.

A detailed report of such inspection is submitted to the assured, incorporated in which are recommendations as to the installation of

such appliances, safeguards and improvements of physical conditions as would result in the avoidance of accidents.

Our inspection department employs technical graduates from Brown University, Harvard University and Massachusetts Institute of Technology, so that our assured may have the benefit of the advice of trained specialists.

Elevators are regularly inspected every three months, and in specific cases every three or four weeks.

Employers' liability, contractors' and general liability risks are inspected once annually, and in many instances three times a year, in response to awakened interest on the part of the assured, in the endeavor to give them the highest service tending to safety and substantial improvement.

In making such inspections the moral as well as the physical conditions are carefully considered and brought to the close attention of the assured for favorable consideration or action towards improvement, with such suggestions, sketches and illustrated literature as would aid in selection of safety devices to meet the individual case.

Our monthly publication incorporates an accident prevention department containing specifications and illustrations for the guide of our assured. These are also published in loose leaf form so that such as apply to any particular type of protection may be forwarded with each list of recommendations.

We can say with much gratification and encouragement that the attitude of most of our customers indicates a keen interest and willing co-operation to carry out any and all reasonable suggestions tending to the prevention of accidents, and our records show a satisfactory percentage of recommendations complied with.

Reinspections are made as the nature of the business demands, to the end of obtaining as high an efficiency in the safety-first movement as possible.

A follow-up system is carefully maintained, and in the event of tardy compliance with recommendations we again call attention to the matter by letter, and when necessary have the inspector visit to explain any features in doubt.

With this report the Massachusetts Bonding and Insurance Company enclosed samples of report forms used in their inspection work, as well as a number of circulars covering guards now on the market.

MASSACHUSETTS EMPLOYEES INSURANCE ASSOCIATION.

The Massachusetts Employees Insurance Association has steadily continued the campaign of safety work among its members which was started at the beginning of the compensation act. Very excellent co-operation in this work has been given by its subscribers, 50 per cent. of whom, on Nov. 1, 1914, had completed every safety recommendation submitted to them. The other members of the association are also making satisfactory progress in their safety work. The net result is that about 15,000 danger points have been eliminated through the installation of guards, enclosures and other safety devices.

Soon after its formation the association made investigation of the accident hazards peculiar to certain industries, and prepared safety specifications which were accepted by the insurance commissioner as a basis for special merit premium reductions, and which were subsequently adopted by other companies writing compensation insurance in the State. These studies of special hazards have been continued by the association in other industries, such as electric power companies, textile factories, lead workers, punch press work, printing trades, etc.

A careful survey has been made of the several types of occupational disease that may arise in certain industries, and the co-operation of subscribers is being obtained in working out practicable methods of prevention.

Much attention has been given to conditions that may subject employees to fire hazard or explosion hazard. The association recognizes the importance, from the employee's standpoint, of requiring in its factories both adequate means of exit in case of fire and careful methods of "housekeeping" in the prevention of fires. In several cases where conditions have warranted it fire-alarm systems and fire drills have been instituted upon the initiative of the association. It is worth emphasizing that employers of labor benefit in two ways from safety work of this class, viz., in the reduction of injuries to employees and in the reduction of property losses.

One special activity of the safety department of the association has very clearly justified itself, viz., the requirement (wherever applicable) that employees be given actual instruction in applying resuscitation. While the demand for resuscitation treatment may arise wherever the hazards of drowning or gas asphyxiation exist, the important application of the treatment is to the electrical hazard. The ever-increasing use of electricity in all types of industry gives the subject of resuscitation from electric shock a very widespread interest and value. Careful study of the subject has shown that low-voltage as well as high-voltage shocks may produce suspended animation, where the immediate application of artificial respiration becomes imperative. In such cases there

is not time to call for help, but the fellow worker of the victim must be depended upon if the life is to be saved. The association has brought this matter to its subscriber's attention, not only by use of the charts of the standard resuscitation method (see page 341 and figure 25), but it has required that any employees subjected to this electrical hazard be given actual demonstrations of the method, under competent supervision. The important point is to give the employee such confidence in the method that he will act without hesitation when the emergency arises.

In some of the larger companies a series of lectures has been given by physicians who have made a special study of electrical resuscitation, to which the employees were invited by groups. In these meetings each man has had the method applied to him, and applied it in turn to others. In this thorough manner the knowledge has been spread to several thousand workmen, and already a number of lives have been saved as a result.

The mechanical type of accident can be largely eliminated by bringing the physical conditions of the factory or plant up to a high standard of safety. However, there will still remain a large and important number of accidents of the "non-mechanical" type, such as those from hand labor, falls, vehicles, infection, etc. The safety education of employees is therefore quite as important as the installation of safety devices.

While it may be felt that the application of mechanical safeguards in any factory can eliminate only a portion of the accident hazards, it has been noted that plants in which a high standard of mechanical guarding has been attained usually have a correspondingly good record in respect to the so-called "non-preventable" accidents. This may be ascribed in part to the management's attitude, but it is probably true that safe and orderly mechanical conditions have a direct psychological effect on the employees in making them personally more careful to avoid accidents. Underwriting experts recognize this effect in their estimation of the "moral hazard." Either the genuine interest in the prevention of accidents on the part of the employer or labor, or his indifference thereto, is reflected in the attitude of the employees themselves.

It has been found that, with very few exceptions, employers of labor have been willing to take up safety work even where their own experience has not apparently indicated the need. The few exceptional cases, where a negative attitude is taken, are factories where no recent accidents of a serious nature have occurred, although a detailed examination of the equipment shows that some of the common types of hazard do exist. To obtain the employer's co-operation in such cases the analysis of accidents given in the first annual report of the Industrial Accident

Board has proven of much value. The desired elimination of any particular hazard is obtained by citing the exact number of accidents that have occurred during one year in the State upon an identical hazard in other shops. The quantitative results shown from even the brief experience of one year often prove astonishing, and leave no room for skepticism in the carrying out of reasonable safety recommendations.

In electrical work fatal accidents have often resulted from an unexpected charge on apparatus that was supposedly disconnected from the circuit, or "dead." The electrician in his cleaning or repair work has to come into direct contact with live parts of the apparatus in question.

The apparatus is cleared for him by opening the switches of all circuits that might feed any charge into it, either directly or indirectly. Beyond this, however, there is nothing in the appearance of the apparatus to show whether it is actually free from charge or not. There may be a mistake in switch connections, an accidental cross onto another circuit, etc. In high voltages, where the man's life depends on the circuit being dead, some direct and positive test of charge is needed. This is obtained by connecting the apparatus to ground.

Fig. 20 shows one form of grounding device that has been used on high-tension 3-phase equipment. It consists of three flexible wires, one end joined permanently to ground, and metallic hooks on the free ends. By means of three insulated wooden poles these hooks can be placed directly on the parts of the apparatus in question, and, if any charge exists, it will be carried to ground, thus protecting the operator from accidental shock.



FIG. 20.

Fig. 21 shows a well-guarded swing saw in which the saw itself has a casing that encloses the entire upper half of the blade. The belt and pulley are enclosed in a light woven-wire guard, and a convenient handle is provided which also serves as a brace for the saw casing. The counterweight arm at the top of the machine (not shown in the figure) has provision to keep the weight from dropping off in case its set screw should become loose, thus preventing an accident from the falling weight or from the unexpected swinging forward of the saw arm.



FIG. 21.

The danger from bursting emery wheels is already being generally recognized in safety work, but there are several details in connection with the use of such wheels which require further emphasis. Fig. 22 illustrates an emery wheel stand after the wheel had burst and killed the operator. There was a dust hood on the wheel, but this was too light in construction to act as a guard against a bursting wheel. It will be noted that the flanges are of unequal diameters, the outer one having been reduced in size to permit side grinding. The inner flange is of full size, and is recessed in the usual way so as to give a bearing only along the outer edge. It will be readily seen that the firm clamping of the wheel between these unequal flanges will set up an initial cupping stress, upon which will be superposed the necessary stresses due to rotation and pressure of the stock. Thus the factor of safety may be reduced to the danger point, especially if the clamping nut has been set up hard. In the present case the wheel had been running slightly over the prescribed speed, because the operator had thrown the belt on to the small pulley. This further added to the stresses, and the wheel broke, with fatal results, as stated.

The danger of unauthorized change in speed should always be guarded against on 2-speed spindles, as by means of a strap locked over the high-speed pulley, or a belt shifter having interlocking levers that will prevent use of the high speed until the wheel has worn down to any prescribed diameter.

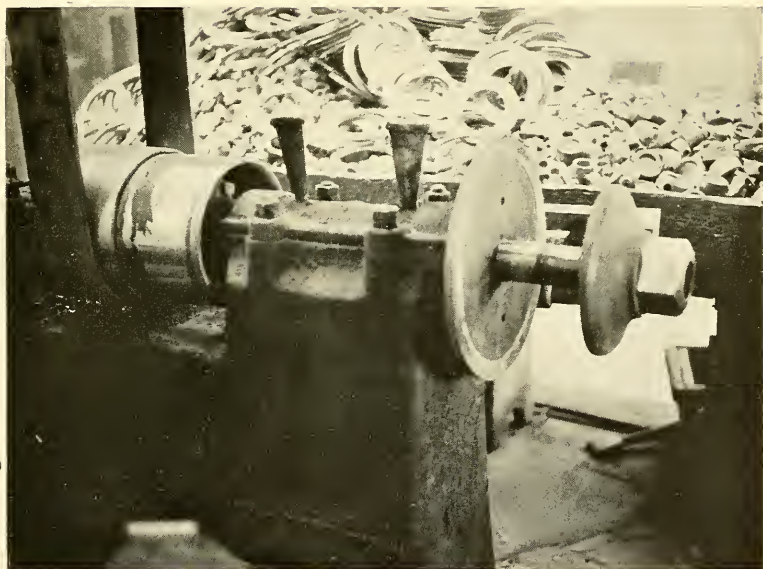


FIG. 22.

In the use of steam tables, steam drums, etc., in manufacturing processes, very careful consideration should be given, from the safety standpoint, to the details of installation and manipulation, so as to avoid all chance of overpressure or uneven expansion from too rapid heating, either of which might result in an explosion. While the bursting of such devices would not be expected to cause such serious results as a boiler explosion (since less energy is involved), the location of the devices directly in factory rooms with many employees near by makes it possible for an explosion of even small magnitude to result in serious or fatal injury, from flying parts, from escaping steam and from panic which is very likely to follow.

The illustration in Fig. 23 shows an exploded cylinder of a laundry flat-work ironer, which occurred while it was being heated up for the day's work. The bolts which hold the head on to the cylinder failed, partly from defective design and partly from old flaws or "progressive fractures" which had developed from repeated heating and cooling. The explosion not only wrecked the machine itself as shown, but also blew out the side of the building. Several fatalities would undoubtedly have resulted had the explosion not occurred, fortunately, outside of working hours, so that no person happened to be in the room at the time.

All factory devices that operate under steam pressure should be carefully designed to insure ample factors of safety. Where they operate through reducing valves at pressures below that of the boiler supply, safety valves of adequate capacity should be installed on the low-pressure side to prevent building up of pressure in case of defect in the reducing valve. When the device is cold from being out of service, it should be heated up very gradually to avoid the stresses that might be produced by uneven expansion, and reliable arrangements to prevent accumulation of water or condensation should be provided, since in case of failure the presence of condensation would add materially to the energy of the explosion. The steam cylinder should also be revolved while it is being warmed up, to prevent expansion and contraction stresses resulting from unequal heating.



FIG. 23.

The horizontal belts used to drive the vertical spindles of multiple drills, radial drills, boring machines, etc., have a special element of hazard, due to the fact that the operator's eyes are often in close proximity to the moving belt, and might be injured in case the belt should break or a lacing work loose. This danger can be readily eliminated by a simple band guard placed across the danger point, as illustrated in Fig. 24.



FIG. 24.

The manual method of resuscitation which the association recommends is that approved by the Commission on Resuscitation of the National Electric Light Association,—the so-called “Prone Pressure Method.” Fig. 25 shows the two essential positions of the method,—the upper one that of inspiration and the lower that of expiration.

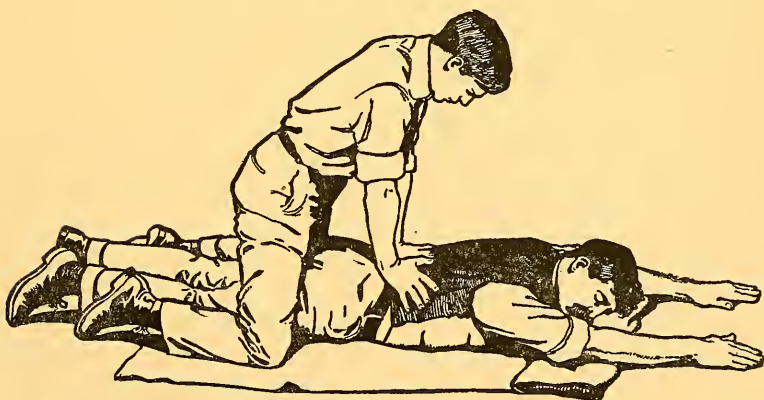
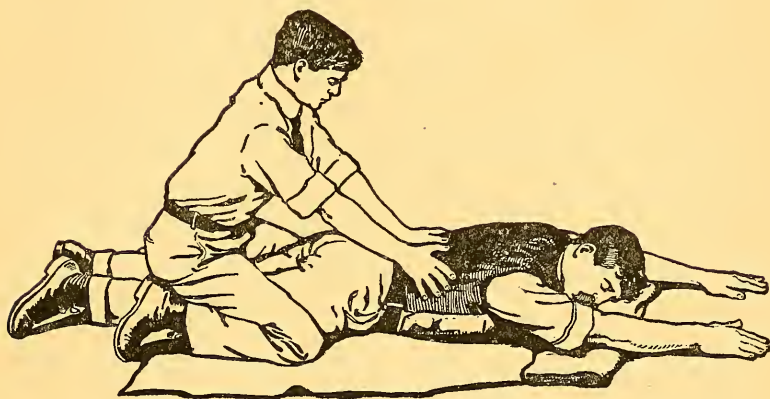


FIG. 25. Copyright, 1912, by the National Electric Light Association, and reprinted with their permission.

NEW ENGLAND CASUALTY COMPANY.

The need of practical accident prevention is too widely known to-day to require much discussion. I might state that the average employer grasps the significance of "safety first," and cannot but feel that, through his activities and the scope of legislation by compensation insurance, considerable headway has been made in reducing accidents in Massachusetts industries.

Statistics so far prove that about 25 per cent. of the accidents can be reduced through safety devices; therefore I believe the only practical method to reduce the other 75 per cent. is through organization and education. In analyzing hundreds of accidents it has been found that by a large percentage carelessness combined with ignorance, or, rather, indifference, on the part of the injured stands highest as a contributing cause of such accidents; therefore the natural question suggests education, viz.:—

Remember accidents nearly always result from carelessness or indifference to the safety of yourself and others.

Be careful in doing your work.

SAFETY ALWAYS.

To avoid unnecessary accidents take the SAFE COURSE. STOP, THINK, REASON.

Be careful in whatever work you are called upon to do.

Rules and regulations, safety devices and guards lose their efficiency unless every one cultivates the HABIT of being careful.

SAFETY ALWAYS.

The above slogans are more truth than fiction.

The engineering and inspection department of this company is emphasizing the educational side of safety work, and in this regard is conducting a campaign for the purpose of encouraging manufacturers and individuals in the social, safety and efficiency development in industrial plants. In this connection the fore step must be in the direction of interesting the employer and securing his co-operation. He must provide measures and show through his activities his keen interest in social development. He must place upon department heads certain responsibilities, and upon their own merits safety and efficiency depends. The department heads naturally must obtain the co-operation of the workmen; and in this regard, whether in a small or a large plant, the workmen must be given an active part in the safety campaign.

To give you ocular evidence of what organization means we attach the statistics of a very large manufacturing plant in which we organized a social, safety and efficiency committee in 1913. This is only one of the reports which we have so far compiled, and feel confident that many others which we are formulating will show still greater results.

In addition to the work which our department has undertaken we have established a bureau of information which exists for the sole purpose of having clients or manufacturers submit as many consultations and questions as they like relative to the solution of any and all aspects of safety and engineering problems as these come before them in their own plants. You will readily appreciate the manifold advantage of this; it is the strictly specific side of our service.

“Habit” is the strongest thing in the world; let us unite in cultivating the “safety habit.”

The following statement as to the number of inspections made in Massachusetts and the number of defects found covers the period from Jan. 1 to June 30, 1914, and from July 1 to Sept. 30, 1914.

Massachusetts Report.

Total number of inspections, January 1 to June 30,	. . . . .	2,266
Total number of inspections, July 1 to September 30,	. . . . .	996
Total defects found,	. . . . .	1,407
Total defects remedied,	. . . . .	562
Number of safety committees organized,	. . . . .	15
Number of factory inspection systems (not including safety committees),	. . . . .	12

Comparative Statement showing Number of Accidents before and after Safety Committee was organized.

	Number of Accidents.	NATURE OF INJURY.								PART INJURED.							
		Temporary.	Permanent.	Break.	Cut.	Bruiſe.	Burn.	Internal.	Miscellaneous.	Eye.	Head.	Fingers.	Hand.	Foot.	Leg.	Body.	Miscellaneous.
First Period, Jan. 1, 1913, to Oct. 15, 1913.	58	56	2	2	32	12	2	1	9	8	2	18	14	5	5	4	2
	27	26	1	1	3	3	10	1	9	8	1	1	2	10	2	1	2
	55	52	3	3	29	1	2	—	20	19	3	15	11	1	—	—	6
	Total,	134	6	6	64	16	14	2	38	35	6	34	27	16	7	5	10
Second Period, Oct. 16, 1913, to Sept. 15, 1914.	29	25	4	2	15	4	2	2	4	4	—	13	3	1	2	6	—
	14	13	1	—	3	2	5	1	3	4	—	4	—	2	1	3	—
	22	21	1	1	18	1	—	—	2	2	—	15	2	1	—	—	2
	Total,	50	6	3	36	7	7	3	9	10	—	32	5	4	3	9	2

Total number of injuries for 9.5 months prior to organization of ſafety committee (firſt period), 140

Total number of injuries for 11 months ſince organization of ſafety committee (ſecond period), 65

Injuries per Month classified.

TOTAL NUMBER OF IN- JURIES PER MONTH.	Perma- nent.	Tempo- rary.	Burns.	Wood Shop.	Foundry.	Steel.
First period, 14.7, . . .	.621	14.10	1.47	6.10	2.84	5.79
Second period, 5.9, . . .	.545	5.36	.63	2.63	1.27	2.00

THE OCEAN ACCIDENT AND GUARANTEE CORPORATION,
LIMITED.

The safety engineering work the corporation has been doing in the State of Massachusetts during the past twelve months has concerned, principally, factories and elevators, the examinations of which have been regularly and frequently made by our representatives in Boston. Considerable attention has been paid to those features of manufacturing risks which concern subjects other than what may be properly termed "machine hazards." While we have not overlooked the importance of safeguards for machinery, we have paid great attention to the necessity for proper arrangement of machinery, good light and careful managing. We have been especially careful to see that the small tools in the plants, as well as trucks and other carrying facilities, have had careful attention.

The safeguarding of machinery has been explained through circulars of manufacturers of patent safeguards and by sketches and drawings of devices which were necessary where patented or stock guards were not available. Our methods have been those of personal instructions rather than letter writing and descriptive literature. We have endeavored to show, through the assistance of our engineers, exactly what to do and how to do it. This has been deemed advisable because manufacturers, as a whole, have interested themselves in literature which is now quite easily secured on subjects of "general machine conditions."

Our men, when explaining the reasons for safeguarding, show the manufacturers why the recommendations are necessary, and in many instances where the corporation has had accidents from similar causes draw attention to these accidents. In other words, as far as practical we have endeavored to get away from generalized recommendations, and have endeavored to show in each instance the reason why a guard was needed or a change in the way of working was advisable.

In order to keep our safety engineering force instructed to a degree which will make it practicable for them to give the above information to the manufacturers we furnish them frequently with pertinent information and keep them advised, through our claim department, of accidents which could have been prevented.

ROYAL INDEMNITY COMPANY.

The inspection records of the Royal Indemnity Company show that during the year ending June 30, 1914, the work of our inspectors revealed 54,299 defects, of which 12,689 were classified as dangerous. A very great majority of our recommendations for the elimination of the danger spots were duly carried out, and by this means we have every reason to believe a very large number of possible accidents involving personal injuries have been avoided.

Our chief inspector is a member of a committee of three engineers working on behalf of the Workmen's Compensation Service Bureau, for the purpose of issuing volumes of general safety standards, covering the essential features of general equipment in manufacturing establishments. This work we believe will have very far-reaching effects.

That committee is now working with a view to publishing further safety standards in order that special consideration may be given to this safety work by manufacturers and others when installing new equipment.

THE SECURITY MUTUAL CASUALTY COMPANY.

The Security Mutual Casualty Company maintains an inspection department for the purpose of making liability inspections at the various plants of the companies which it insures. These inspections are made by competent safety engineers, and each plant insured is inspected on an average of twice a year.

During the last year our inspectors have made 15,455 recommendations for the improvement of liability hazards, some of them entailing considerable cost in the carrying out, and it is gratifying to be able to state that over 94 per cent. of the recommendations have been made effective.

Besides carrying on the inspections previously referred to we arrange for the organization of safety committees at all plants which we insure, and the reports of these committees are sent to this office for our information and comments. In this way we keep in close touch with the various safety organizations, and are able to assist them in maintaining a very high standard of efficiency.

We also issue safety handbooks published in eight different languages for distribution among the employees of our various assured, and from time to time arrange to have general illustrated lectures on safety work given at each plant, where its size warrants it. We also carry on a distributing system for the dissemination of safety information, sending photographs of safety appliances and circulars showing safe and unsafe practices for posting on the plants' safety bulletin boards.

It might be of interest to know that since the inauguration of this work the plants which we insure have been successful in reducing the number of accidents of all characters about 33 per cent., and the number of accidents in which time is lost about 48 per cent.

A copy of a book of rules and regulations for the prevention of accidents, and pamphlets and posters illustrating safety devices, which are distributed by this company, were forwarded with this report.

STANDARD ACCIDENT INSURANCE COMPANY.

During the year ending June 30, 1914, this company made 21,052 regular safety inspections. In addition to these there were made 5,580 special calls or surveys of various of the company's risks; these dealt with special and peculiar problems in safety which arose during the course of work at the establishments of our assured.

There were 9,707 expert inspections of passenger and freight elevators, together with an indefinite number of calls in cases where the assured desired the special advice of the inspectors in matters of safety and maintenance.

We made 6,881 inspections of office, mercantile, tenement and apartment buildings, covering thoroughly all conditions affecting safety.

The regular safety inspection of factories, which forms the most important part of our work, has been conducted upon what we believe to be a highly efficient basis. We have made regular annual inspections of all manufacturing establishments. In many cases, where the work done is especially dangerous to employees, more frequent inspections were regularly made, and such special surveys of any of the company's risks were made as became necessary, due to the occurrence of accidents, or were requested by the policyholders. This work was all done by specially trained men, using methods of proven efficiency. At each inspection the following points were carefully considered: (1) fire hazard and adequacy of escapes in case of fire; (2) storage and use of explosives; (3) inspection and care of high-pressure boilers; (4) other power equipment; (5) heating apparatus; (6) general care and cleanliness of plant; (7) ventilation; (8) the providing of adequate first-aid outfits and arrangements for their intelligent use in case of injury; (9) lighting; (10) machine defects and safeguards; (11) employees and discipline.

All recommendations made by the inspectors have been promptly communicated in writing to the management of the plant. Care has been taken to make only recommendations which were practicable, and we have insisted upon a compliance with each of them. Whenever it has been possible to do so we have given the assured personal assistance

in doing the work, and in some instances our inspectors have remained at the plant until the work has been completed.

We have given a great deal of attention to the prevention of eye accidents. Tests have been made of different forms of eye protectors to determine those best suited to various kinds of work which involve danger to the eye. The results of our experiments along this line are given our clients with recommendations covering the particular form of work done in each case.

We have prepared seventeen different styles of warning signs covering the majority of factory or shop conditions which call for notices of warning. These are supplied without charge to our policyholders.

Expert investigations are made of all new devices for the prevention of accidents. These investigations include the observation of the guards in actual use, and are of much benefit to our clients in avoiding investment in guards which may prove to be impracticable for their use. We maintain constantly a force of safety inspectors who give expert advice and assistance to our policyholders in all matters relating to the prevention of accidents whenever it may be desired. This service is gratis.

During the past year we have investigated thoroughly the experience of a large number of manufacturers, great and small, with safety committee work and general shop organization for safety. Industrial accident statistics, wherever compiled, have invariably shown that the majority of accidents (ranging from 65 to 85 per cent.) were the result, not of the failure of the employer to provide physical safeguards, but carelessness, thoughtlessness, ignorance, indifference to danger, etc., on the part of the injured employees and their immediate supervisors or foremen. Investigation and experiment have further shown that it is possible to reduce, and in some cases practically eliminate, these sources of injury through a properly conducted campaign for the education of industrial workers in matters of safety. This has involved, among other things, placing the responsibility squarely upon the employees by the operation of committees of workmen to suggest ways and means of improving conditions, to discover and correct unsafe practices, to watch and caution careless workmen, and to enforce the use of safeguards already provided. As a result of our careful observation of the methods and practices of many manufacturers who have been successful in this work we have developed a definite plan of procedure, and we have undertaken the formation of committees, organizations, etc., in many of our policyholders' plants.

As one of our plans for future extension we propose to continue our investigation of this subject and to endeavor during the coming year to interest each one of our manufacturing assured.

The company is gradually widening the scope of its safety and welfare work. Appreciating that health of factory workers has direct

bearing upon their ability to protect themselves from injury we are undertaking the education of the employees of our assured in matters relating to the care of their health. This will take the form of booklets and pamphlets containing health hints, to be supplied our clients without charge for distribution among their employees. As practicable, we expect to extend our efforts along this line still further.

We have installed a system for the tabulation of accidents reported to the company by kinds and by industries. This enables us to know exactly what conditions are responsible for the accidents in each line of work, foundries, machine shops, planing mills, saw mills, flooring mills, etc. We can, therefore, give our inspectors definite instructions as to what safeguards and precautions to recommend. This places our work of inspection upon a practical, sure, effective and systematic basis, removing very nearly all of the element of uncertainty which has heretofore necessarily been a part of every inspector's work.

The general results of the statistics are interesting. During three months, April, May and June, 1914, there were reported 4,298 accidents. These are divided as to general causes as follows: —

1. Personal shortcomings on part of injured or fellow employee, such as recklessness, carelessness, ignorance, forgetfulness and incompetence, . . .	2,870, or 66.37 per cent.
2. Absence of safeguards (this also includes accidents in cases (a) where there was a failure to provide railings, toe boards, etc., in construction work not subject to inspection; (b) where special conditions of work arose after inspections were made, such as new machinery, repairs, new processes, etc.; and (c) where, through the employer's fault, safeguards already provided were not maintained or required), . . .	518, or 12.05 per cent.
3. Defects in machinery or equipment (this division includes three accidents directly traceable to insufficient illumination and five accidents due to poor ventilation and unsanitary conditions), . . .	355, or 8.67 per cent.
4. Accidents due to miscellaneous causes and those accidents of minor importance, in connection with which no certain information could be obtained, . . .	555, or 12.91 per cent.
Total,	4,298, or 100.00 per cent.

Eliminating those accidents, the full details of which could not be learned, and using the total of 3,743, the percentage of accidents due to carelessness, etc., is 76.66 per cent. These are the accidents which we aim to prevent with the safety organization work.

THE TRAVELERS INSURANCE COMPANY.

Bearing steadily in mind its well-known maxim that the prevention of an injury is a benefaction, while compensation for it is an apology, the Travelers Insurance Company has made marked progress in its work of accident prevention during the past year. The public has everywhere shown a rapidly increasing appreciation of the benefits, economic as well as humanitarian, that result from systematic, intelligently conducted efforts to prevent industrial accidents; and this tendency, although it has been very encouraging and stimulating, has given rise to problems of ever-increasing complexity and difficulty. With growing realization of the possibilities of practical work of this kind, an increasing demand for it has come from all directions, and to cope with this demand efficiently we have continually broadened and extended our activities, and have continued our study of accident-prevention methods along special lines, ramifying in countless directions and covering not only manufacturing but also transportation, mining, construction work, power production and transmission, chemical industries, and, in fact, the useful arts in general.

Successful accident-prevention work covering the entire range of industrial activity requires first of all a competent executive staff, with broad and varied experience and a wide knowledge of principles and facts. In the Travelers Insurance Company and the Travelers Indemnity Company this staff consists of a chief engineer, an assistant chief engineer, and numerous other engineers who act in an administrative and advisory capacity. These men supervise the work as a whole, and they also deal with special problems, emergency cases and all new matters that may come up. Associated with them is a large force of scrutinizers, who examine and check the reports of the 200 inspectors who are maintained in the field.

To obtain a full measure of success in accident-prevention work it is important for the field inspectors to be both reasonable and tactful in making recommendations for safeguarding dangerous conditions. Every inspector can relate many experiences wherein employers have differed with him as to the necessity of safeguarding particular machines or conditions. To the inspector the condition may seem dangerous enough to call for a safeguard, while to the employer the chance of accident seems so remote that he considers it a waste of time and money to install the guard. It is part of the duty of the inspector to satisfy the employer on this point, and to persuade him that the installation of the guard is well worth while; but it is also a part of his duty to avoid putting the employer to needless trouble and expense by asking him to do unreasonable things that are required neither by law nor by a proper regard for safety. In other words, to be a field

man of the first order he must not only have a competent knowledge of his business, but must also exercise nice judgment and be something of a diplomat.

The mechanical features of safety engineering can be well taken care of by the competent inspector. He is familiar with the different safety appliances that are used in factories and workshops, and he knows their worth. He will see that gears, wheels and projecting set screws are properly guarded; that shafts, pulleys and belts are boxed in or otherwise effectively protected; that belt shifters of a practical and substantial design are installed; that stairways, ladders, platforms and raised gangways have guard rails and toe boards to prevent men and material from falling; and that lighting (both natural as well as artificial), sanitation and ventilation are up to the standard. But even after taking all these precautions, and perhaps many others in addition, the most important and difficult part of accident-prevention work still remains to be done. It has been estimated that from 30 to 35 per cent. of the avoidable accidents of our industries can be eliminated by the installation of suitable safeguards, the elimination of the remaining 65 or 70 per cent. being largely a matter of education, instruction and supervision. The inspector who has a definite territory to cover, and who can therefore give to each plant only time enough to thoroughly examine its physical condition at the time of his visit, cannot deal effectively with this personal branch of the work. He can indicate the lines along which problems of this kind should be handled, but the actual work must necessarily be done by safety committees, or local safety inspectors, who will attend to the instruction of new employees, see that careful and competent men are assigned to supervise dangerous work, discipline the careless man or the chance-taker, provide for the distribution of safety literature, post warning placards and signs, and perform other duties also.

The work of educating and instructing the workers along safety lines is growing more difficult each year, because in many plants the workers are coming to be of a distinctly inferior order. The difference is quite marked when the plants of to-day are compared with those of a decade or two ago. In metal working, for example, the productive capacity of the tools and machines depends upon the design of the machines, as well as upon the skill of the workmen. Formerly the skill of the workman was by far the more important factor of the two, but to-day the relative importance of man and machine has been almost wholly reversed in many cases. A piece of work that only a few years ago required the services of a skilled mechanic can now be produced by an automatic machine, attended by a "hand" who may know very little of the process of manufacture, or of the construction of the machine that he operates. This gradual trend toward automatism in

machine operation has been accompanied by a gradual elimination of the skilled mechanic in favor of the cheaper unskilled laborer. Production by specialized machinery has brought forth a class of men who need little or no skill beyond the ability to operate one specific machine, which is largely automatic; and this is slowly eliminating the all-round machinist. The term of apprenticeship has been cut down to the time necessary for a man to become proficient in the operation of one or two machines. He can then earn a living wage so long as there is a demand for the product of the machines that he can run, and any further time spent in the apprentice shop seems, to these men, to be wasted. This tendency toward the replacement of skilled labor by labor-saving devices and unskilled labor has been manifest in all classes of industry, and it must be carefully considered in connection with accident-prevention work.

Having in mind the importance of education and the formation of a healthy "safety-first" spirit among the workers the Travelers Insurance Company, in addition to maintaining a large force of skilled inspectors in the field, has organized a department of technical publication, the work of which consists chiefly in the preparation and publication of articles, books and pamphlets dealing with engineering and accident-prevention topics. For the past two years this department has issued a monthly 20-page journal known as "The Travelers Standard," each issue of which contains timely articles of much value in connection with accident-prevention work. This journal deals with engineering matters of all kinds, but its main effort is directed toward safety engineering as applied to construction work, manufacturing, mining, power generation and transmission, the electrical and chemical industries, and every other form of activity in which machinery or tools are used, or human life and limb are imperiled in the doing of productive work. The circulation of this journal has greatly increased during the past year, and the journal itself has been everywhere found to be helpful and authoritative.

The series of technical booklets that was begun at about the same time has also been continued, and a number of important subjects have been treated in this way during the past year. The first issue, which was entitled "Grinding Wheels," describes and illustrates approved methods of safeguarding emery wheels, grindstones, polishing wheels, and grinding wheels made from alundum, carborundum and other similar products. Recommendations are given covering the safe speeds at which such wheels may be operated, as well as proper methods for mounting and using them and for removing the dust produced by the grinding.

The second booklet, on "Elevators," outlines the principal safety requirements for elevators for both passenger and freight service. It

is fully illustrated with engravings showing safety devices and other approved features of modern elevator practice.

The next booklet in the series, entitled "Boiler Economy," deals with the economical and safe operation of a boiler plant. The fuel problem, firing by hand and with mechanical stokers, the treatment of feed water, methods of cleaning a boiler, and the use of feed-water heaters and of economizers and superheaters, are among the many useful topics that are thoroughly and authoritatively explained. This booklet has had an especially wide circulation, and it has elicited many expressions of appreciation from owners and users of boilers, and from manufacturers in general.

"Accident Prevention in Paper Mills" and "Illumination and Accident Prevention in Paper Mills" are the titles of two booklets devoted to safety in the paper industry. The first of these deals with the hazardous features that are met with in and about paper mills, while the second points out the increased dangers in such mills by reason of poor illumination, and shows how greater safety may be secured by more rational treatment of the lighting plant. The demand for these booklets was so great that a second edition was necessary a short time after their appearance.

The next booklets, called "The Employee and Accident Prevention" and "Foremen and Accident Prevention," have had the widest circulation of any that have thus far been issued. The purpose of the first is to call the attention of the workman, in simple concise English, to the more common causes of accidents. Most of the suggestions that are made are familiar and obvious, yet it is the neglect of these very precautions that causes a great majority of the accidents of our industries. As the preface says, "If past experience can enable us to judge the future, more than 10,000 of the workers of the United States who are alive to-day will be dead in one year from this date, merely because they did not heed the suggestions that this little book contains." Although the first edition of "The Employee and Accident Prevention" was made very large in view of a probable heavy demand, the actual demand exceeded all expectation, and the booklet is already in its third edition.

"Foremen and Accident Prevention" treats the same subject from the administrative viewpoint, and is addressed to foremen and other authoritative persons who have the power to remedy the hazardous conditions and practices mentioned in the book. It deals in greater detail with many of the subjects treated in "The Employee and Accident Prevention," and for this reason administrative officers should study the two books together. The demand for this book has been second only to that for the one which is addressed to the employee.

It was issued at a later date, but the second edition is already approaching exhaustion.

In connection with the two last-mentioned booklets another closely related one has been published under the title "Organization of Safety Work in Industrial Plants." This points out the importance of organizing the safety work in order to obtain the most satisfactory results. It tells how the organization should be effected, explains the nature and duties of safety committees, suggests ways in which foremen can help the work along efficiently, discusses the language problem and the qualifications and duties of interpreters, gives many suggestions for safety rules, shows illustrative forms for report blanks of various kinds, and contains numerous other data which should be exceedingly useful to employers who are actively engaged in safety work, or who contemplate engaging in such work.

A booklet has also been issued under the title "Safety in Moving-Picture Theaters," which treats of the special hazards that have to be considered in connection with entertainment places of this kind. The first section deals with entrances, exits, stairs, tunnels, seats, aisles and floors, and their bearing on the public hazard. The second section discusses the dangers connected with the operation of the moving-picture machines, and with the type, location, size and construction of the booth. The various fire and electrical hazards within the booth are fully discussed.

"Accident Prevention on the Farm" is the title of the latest booklet of the series that has been printed up to the time of writing the present article. The hazards connected with farm work have not hitherto received proper attention in safety literature, very likely because qualified writers have not appreciated the enormous number of casualties that occur in connection with agricultural pursuits. The booklet is thoroughly practical. The advice that it contains is "close to the soil," and farmers who adopt the suggestions it contains will find that the number of accidents on their farms will be materially reduced.

During the year a great deal of work has been done toward the preparation of a large, fully illustrated treatise on scaffolding in all its more important forms. This is nearly ready to go to press. It has been written with extreme care, and it is confidently believed that it will at once take rank as the leading authority upon American practice in the use of scaffolds and stagings. This subject has also been strangely neglected by writers on safety subjects, although it is well known that there are many lives lost every year through accidents connected with scaffolding.

Another large work, dealing with the illumination of industrial plants, is also in an advanced stage, and will be brought out in the near future. Many accidents that are ordinarily assigned to other causes are really due to poor illumination, and could easily be avoided

if the lighting system were installed in conformity with sound principles. Illuminating engineering has already risen to the rank of a special profession, and in this treatise we shall give the general results of theory and experience, so far as they are useful in connection with the illumination of shops, factories and other industrial plants.

The Travelers Insurance Company proposes to continue the publication of works of the character reviewed above, and the activities of the past year in this direction may be taken as prophetic of future work of a like nature.

Fig. 26 shows safety arrangements on paper slitter. The knife is protected by a wire mesh casing, and the connecting rods and gear wheels are effectively guarded by screens of similar construction.

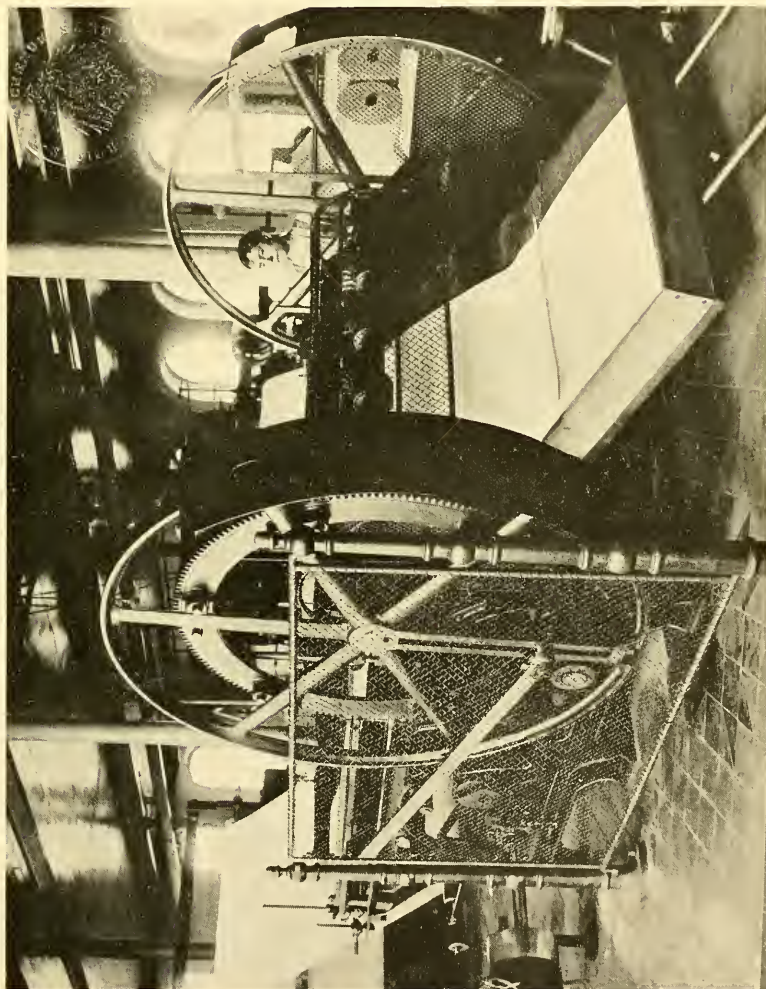


FIG. 26.

Fig. 27 shows bolt cutter with guards over gears. Notice the complete enclosure of all dangerous moving parts, including the motor. The perforated metal guard over the motor insures adequate ventilation.



FIG. 27.

Fig. 28 shows belt safeguarded by rail and, on the intake side, by screens. Special attention is called to the screen guard near the face of the pulley, and extending out over the lower side of the belt. With this guard, placed on the inrunning side of the belt, it is impossible for workmen to have their hands or clothing caught, or for objects of any kind to fall on the belt and be drawn in between it and the pulley.

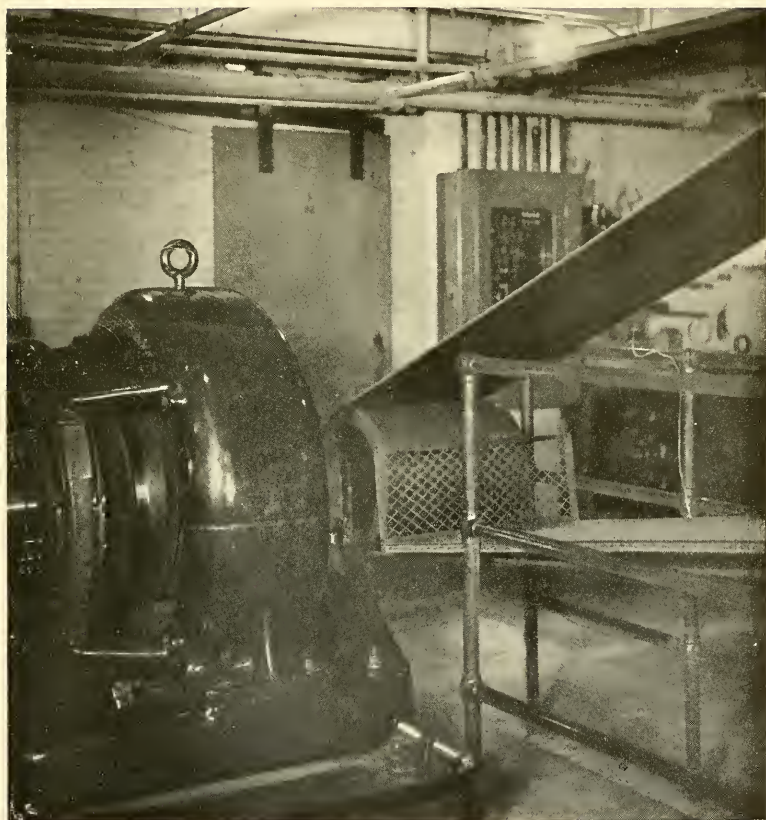


FIG. 28.

Fig. 29 shows guards over belts on oxygen pumps. These guards are light but substantial, and afford complete protection; at the same time inspection is facilitated, and for this reason they are preferable to sheet metal, cast iron or wooden guards.

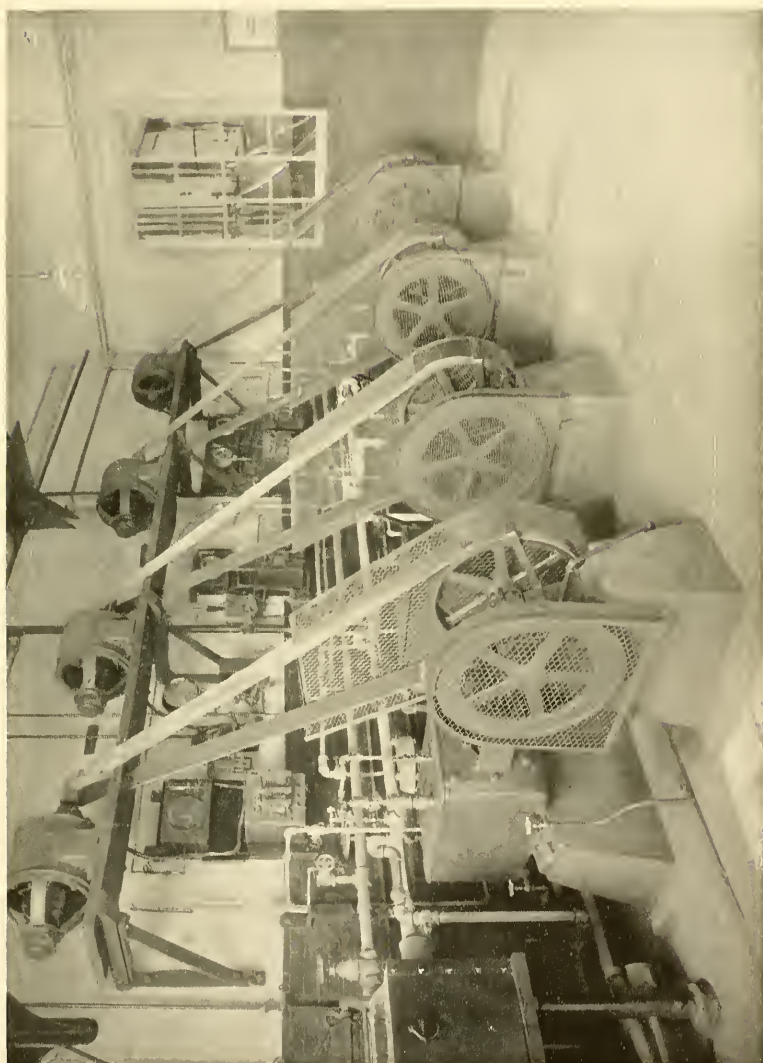


FIG. 29.

UNITED STATES CASUALTY COMPANY.

The Inspection Department of the United States Casualty Company has a staff of forty-five trained men devoting their time and attention to inspections.

During the past year we have made 35,758 inspections and we have reported to our assured 18,436 defects and suggestions along safety and sanitary lines. All of these suggestions have been followed up and have been remedied by our assured and we have found that the employers of labor are ready and willing to go to considerable expense when the necessity for particular safeguards or changes in the plant to prevent accidents are properly demonstrated to them.

All liability and compensation risks are inspected at least once and in some cases as many as three or four times a year. Elevators are inspected at least three times a year and steam boilers are inspected at least twice a year.

We are maintaining at the home office a museum of safety appliances for the education of our inspectors and our assured. This museum during the year has been greatly augmented and in addition to this we have arranged so that our attention is immediately called to any new safeguard or device so that we may immediately call the attention of our entire staff to the same.

THE ZURICH GENERAL ACCIDENT AND LIABILITY INSURANCE COMPANY, LTD.

The Zurich has been operating in the United States since Jan. 1, 1913, and in the State of Massachusetts since April, 1913. In that time 38,265 inspections have been made throughout the United States, and 2,890 inspections have been made in the State of Massachusetts. A total of 26,885 recommendations were submitted to assured throughout the United States, and a total of 565 recommendations were submitted to assured in Massachusetts.

We have to admit that most of our recommendations were complied with by the assured, who seem to realize more and more that efforts to reduce the number of industrial accidents are undertaken by the companies as much in the assured's interest as in the interest of the companies.

As a usual thing, the inspectors of a casualty company have permission to visit plants and to discover physical defects which must be reported to the office to which the inspector is attached, and in turn the matter is taken up by the office with the agent, by the agent with the broker, and by the broker with the assured.

It is the plan of the Zurich to train its inspectors so as to make them real experts in their line, with the fullest possible grasp of the require-

ments of the company, so as to permit them, while at the plant, to discuss with some person in authority the actual carrying out of the recommendations, and in case of need to demonstrate how this can be done.

In this age, when economy is one of the watchwords of the casualty business, it is essential that best results shall be obtained in the inspection department at the least possible cost, and this can be done only by the employment of competent men who can decide right on the spot just exactly what is required to be done.

If it should happen that some problem out of the ordinary should arise, the Zurich inspectors and engineers have instructions to furnish details of same to the home office, where the men in charge of the department are willing to undertake to submit plans for the solving of such problem.

The Zurich, contrary to precedent, has commenced to instruct its inspectors as to the rating of risks, as it considers that it is an important part of the education of an inspector that he should know something about the relative accident cost in different industries.

It is our opinion that eventually the inspection department should become the rate-making body of a casualty company, as no one should be better qualified to make rates than the man who has actually seen in operation the plant to be underwritten.

APPENDIX.

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STATISTICAL TABLES.

TABLE I. — *Non-fatal Accidents. — Insured, Not Insured, Common-law Rights, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	Insured.	Not insured.	Common-law Rights claimed by Employees whose Employers are insured.
Agriculture,	99	8	-
Forestry,	84	3	-
Animal husbandry,	20	1	-
Ice harvesting,	112	21	1
Mining,	6	-	-
Quarrying,	421	23	2
Building and hand trades,	7,579	59	48
Fertilizer makers,	79	11	-
Paint makers,	80	-	-
Powder, cartridge, fireworks, etc., makers,	25	-	-
Soap makers,	55	-	-
Other chemical workers,	602	2	1
Brick makers,	64	-	-
Potteries,	40	-	-
Tile makers,	15	-	-
Glassmakers, workers,	107	-	-
Terra-cotta workers,	16	-	-
Lime, cement and gypsum,	65	1	-
Marble and stone cutters,	285	2	-
Clothing makers,	271	-	5
Corset makers,	60	34	-
Glove makers,	2	-	-
Hat makers (wool or felt),	38	3	-
Shirt, collar and cuff makers,	68	1	-
Bakeries,	678	2	3
Butter and cheese makers,	2	-	-
Candy,	492	-	-
Fish curers and packers,	53	-	-
Flour and grain mills,	30	1	-
Fruit and vegetable canners, picklers, preservers,	18	-	-
Slaughter and packing houses,	398	328	-
Sugar makers and refiners,	210	-	-
Other food preparers,	247	6	2
Agricultural implements,	181	1	-
Automobile factories,	1,191	3	-
Car and railroad shops,	617	-	1
Foundries and metal working,	9,121	813	13
Iron and steel mills,	435	-	-
Ship and boat building,	591	2	1
Wagons and carriages,	133	1	2
Other iron and steel workers,	4,033	54	4
Harness and saddle makers and repairers,	55	4	-
Leather belt, leather case and pocketbook makers,	84	95	-
Shoes,	4,430	383	10
Tanneries,	1,033	264	-
Trunk makers,	28	-	-
Breweries,	519	2	1
Distilleries,	16	1	-
Other liquor and beverage workers,	182	-	-
Box makers (wood),	532	4	1
Furniture,	812	110	1
Pianos and organs,	436	5	-
Saw and planing mills,	213	2	2
Other woodworkers,	1,116	16	1

TABLE I. — *Non-fatal Accidents, etc.* — Concluded.

INDUSTRIES.	Insured.	Not insured.	Common-law Rights claimed by Employees whose Employers are insured.
Brass mills,	205	1	1
Clock factories,	15	—	—
Copper factories,	75	—	—
Gold and silver workers,	125	1	—
Jewelry factories,	411	—	—
Lead and zinc factories,	20	—	—
Tin-plate factories,	91	37	—
Watch factories,	22	67	6
Brass and copper,	144	—	—
Other metal workers,	510	3	2
Box makers (paper),	325	9	1
Makers of blank books, envelopes, tags, paper bags, etc.,	253	—	—
Paper mills,	1,509	4	3
Pulp mills,	36	—	—
Other papers,	269	3	—
Printing and publishing establishments,	891	17	4
Carpet mills,	296	29	—
Cotton mills,	7,617	156	3
Dyeing and finishing textiles,	672	1	—
Hemp and jute mills,	423	—	—
Knitting mills,	469	—	—
Lace and embroidery makers,	6	—	—
Linen mills,	138	—	—
Print works,	493	—	—
Rope and cordage factories,	83	—	2
Sail, awning and tent makers,	19	—	—
Silk mills,	125	—	—
Woolen and worsted mills,	3,343	49	6
Not specified textile workers,	579	10	—
Broom and brush makers,	154	3	—
Button makers,	116	1	—
Charcoal and coke burners,	1	—	—
Cigars,	40	3	—
Electric light and power companies,	963	3	1
Electrical supplies,	2,414	1,340	1
Gas works,	514	658	1
Oil works,	29	—	—
Rubber factories,	1,363	764	2
Straw workers,	60	2	—
Gas and electric companies,	284	8	1
Other miscellaneous industries and occupations,	1,094	41	—
Workers in "not specified" manufacturing and mechanical industries,	912	4	2
Water transportation,	1,136	275	8
Construction and maintenance of streets, roads, sewers, bridges, etc.,	2,278	341	9
Livery stables,	139	6	—
Truck, transfer, cab and hack companies,	1,545	22	24
Street railways,	2,405	373	2
Steam railroads,	—	4,709	—
Express companies,	222	599	1
Telegraph and telephone,	6	242	—
Other persons in transportation,	26	—	—
Banking and brokerage,	38	—	1
Insurance,	64	2	—
Real estate,	270	1	1
Wholesale and retail trade,	8,285	239	51
Elevators,	3	—	—
Warehouses and cold-storage plants,	264	4	2
Other persons in trade,	69	6	—
Clerical assistants (industry, business or profession not specified),	1	—	—
Professional service (all kinds),	368	104	3
Occupations not in industries,	1,424	33	12
Laundries and laundry work,	190	26	1
Total,	83,920	12,462	250

TABLE II. — *Fatal Accidents. — Insured, Not Insured, Common-law Rights, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	Insured.	Not insured.	Common-law Rights claimed by Employees whose Employers are insured.
Agriculture,	2	1	—
Forestry,	—	1	—
Animal husbandry,	1	—	—
Ice harvesting,	1	—	—
Quarrying,	3	—	—
Building and hand trades,	68	6	—
Fertilizer makers,	—	1	—
Paint makers,	1	—	—
Powder, cartridge, fireworks, etc., makers,	—	2	—
Soap makers,	1	—	—
Other chemical workers,	5	—	—
Brick makers,	1	—	—
Marble and stone cutters,	2	—	—
Bakeries,	1	—	—
Fish curers and packers,	1	—	—
Slaughter and packing houses,	3	3	—
Other food preparers,	1	—	—
Foundries and metal working,	11	1	—
Iron and steel mills,	2	—	—
Ship and boat building,	6	—	—
Wagons and carriages,	1	—	—
Other iron and steel workers,	7	1	—
Leather belt, leather case and pocketbook makers,	1	1	—
Shoes,	4	—	1
Tanneries,	9	—	—
Trunk makers,	1	—	—
Breweries,	4	—	—
Other liquor and beverage workers,	1	—	—
Box makers (wood),	1	—	—
Furniture,	2	—	—
Pianos and organs,	2	—	—
Other woodworkers,	4	—	—
Copper factories,	1	—	—
Other metal workers,	1	—	—
Paper mills,	10	—	—
Other papers,	1	—	—
Printing and publishing establishments,	2	—	—
Carpet mills,	1	—	—
Cotton mills,	11	—	—
Dyeing and finishing textiles,	4	—	—
Hemp and jute mills,	1	—	—
Knitting mills,	3	—	—
Woolen and worsted mills,	10	—	—
Not specified textile workers,	2	—	—
Electric light and power companies,	18	—	—
Electrical supplies,	6	1	—
Gas works,	1	4	—
Rubber factories,	1	—	—
Tobacco,	1	—	—
Gas and electric companies,	6	—	—
Other miscellaneous industries and occupations,	1	—	—
Workers in "not specified" manufacturing and mechanical industries,	2	—	—
Water transportation,	12	5	—
Construction and maintenance of streets, roads, sewers, bridges, etc.	46	14	—
Livery stables,	4	1	—
Truck, transfer, cab and hack companies,	15	2	1
Street railways,	10	3	—
Steam railroads,	—	79	—
Express companies,	4	2	—
Telegraph and telephone,	—	5	—
Banking and brokerage,	1	—	—
Real estate,	1	1	—
Wholesale and retail trade,	35	3	1
Warehouses and cold-storage plants,	4	—	—
Professional services (all kinds),	2	—	—
Occupations not in industries,	6	1	—
Laundries and laundry work,	1	—	—
Total,	371	138	3

[illegible]

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.								Boiler Explosions.		
	Animals, Insects, etc.	Asphyxiation, Drowning, etc.	Assault and Fighting.	BELTING.							
				Shifting by Stick or Hand, etc.	Caught between Belt and Pulley (not while shifting).	Contact with Running Belt (not while shifting).	Hooks or Fasteners (not while shifting).	Struck by Breaking Belt.		Replacing Belt with Stick.	Miscellaneous.
Cotton mills.	11	3	13	29	90	83	38	51	5	9	2
Dyeing and finishing textiles,		1	2	1	8	3	2	—	1	—	—
Hemp and jute mills,	1	—	—	—	4	—	—	—	—	—	—
Knitting mills,	—	—	1	1	3	2	5	—	—	—	—
Lace and embroidery makers,	—	—	—	—	—	—	—	—	—	—	—
Linen mills,	—	—	—	—	3	1	2	2	—	—	—
Print works,	—	—	1	—	3	—	1	—	—	1	—
Rope and cordage factories,	—	—	—	—	2	1	—	—	—	—	—
Sail, awning and tent makers,	—	—	—	—	—	—	—	—	—	—	—
Silk mills,	—	—	—	—	1	1	—	—	—	—	—
Woolen and worsted mills,	5	1	4	14	46	31	16	17	1	7	—
Not specified textile workers,	1	—	—	2	4	2	1	1	—	—	—
Broom and brush makers,	1	—	—	—	—	1	—	—	—	—	—
Button makers,	—	—	—	1	—	—	—	—	—	—	—
Charcoal and coke burners,	—	—	—	—	—	—	—	—	—	—	—
Cigars,	—	—	—	—	—	1	1	—	—	—	—
Electric light and power companies,	6	5	2	1	1	—	1	—	—	—	5
Electrical supplies,	2	2	4	5	4	3	11	—	—	—	1
Gas works,	23	25	3	—	1	2	1	—	—	—	—
Oil works,	2	—	—	—	—	—	—	—	—	—	—
Rubber factories,	1	2	—	4	9	5	3	3	—	1	—
Straw workers,	—	—	—	—	1	—	—	—	—	—	—
Gas and electric companies,	7	8	—	—	—	—	—	—	—	—	—
Other miscellaneous industries and occupations,	—	—	—	—	—	—	—	—	—	—	—
Workers in "not specified" manufacturing and mechanical industries,	3	—	2	1	10	7	1	—	—	—	—
Water transportation,	2	4	1	2	6	4	2	—	—	—	—

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.											
	BURNS.				Cal- enders.	CRANES.						
	Chemical.	Fire.	Hot Objects.	Molten Metal.		Steam, Hot Liquids, etc.	Break- ing Cable or Chain.	Break- ing Hook.	Caught in Moving Parts.	Struck by Load.	Struck on Runway by Moving Crane.	Miscel- laneous.
Agriculture,	—	2	—	—	1	—	—	—	—	—	—	—
Forestry,	—	1	—	—	—	—	—	—	—	—	—	—
Animal husbandry,	—	—	—	—	1	—	—	—	—	—	—	—
Ice harvesting,	—	—	—	—	2	—	—	—	—	—	—	—
Mining,	—	—	—	—	1	—	—	—	—	—	—	—
Quarrying,	—	2	—	—	3	—	—	—	—	—	—	—
Building and hand trades,	14	32	26	16	88	—	—	—	3	—	—	—
Fertilizer makers,	—	—	1	—	2	—	—	—	27	—	—	—
Paint makers,	2	—	1	—	1	—	—	—	—	—	—	—
Powder, cartridge, fireworks, etc., makers,	—	—	—	—	—	—	—	—	—	—	—	—
Soap makers,	—	—	—	—	—	—	—	—	—	—	—	—
Other chemical workers,	45	1	5	1	18	—	—	—	—	—	—	—
Brick makers,	—	—	—	—	—	—	—	—	—	—	—	—
Potteries,	—	1	—	—	—	—	—	—	—	—	—	—
Tile makers,	—	—	—	—	1	—	—	—	—	—	—	—
Glass makers, workers,	1	1	1	—	—	—	—	—	—	—	—	—
Terra-cotta workers,	—	—	—	—	—	—	—	—	—	—	—	—
Lime, cement and gypsum,	1	1	—	—	1	—	—	—	—	—	—	—
Marble and stone cutters,	—	—	—	1	—	—	—	—	—	—	—	—
Clothing makers,	—	—	3	—	4	—	—	—	7	—	—	—
Corset makers,	—	—	—	—	—	—	—	—	—	—	—	—
Glove makers,	—	—	—	—	—	—	—	—	—	—	—	—
Hat makers (wool or felt),	—	—	—	—	—	—	—	—	—	—	—	—
Shirt, collar and cuff makers,	—	—	1	—	1	—	—	—	—	—	—	—
Bakeries,	—	3	11	—	9	—	—	—	—	—	—	—
Butter and cheese makers,	—	—	—	—	—	—	—	—	—	—	—	—
Candy,	—	3	11	—	55	—	—	—	—	—	—	—
Fish curers and packers,	—	—	—	—	1	—	—	—	—	—	—	—

[illegible]

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc. — Continued.*

INDUSTRIES.	CAUSE.											
	BURNS.					Calenders.	CRANES.					
	Chemical.	Fire.	Hot Objects.	Molten Metal.	Steam, Hot Liquids, etc.		Breaking Cable or Chain.	Breaking Hook.	Caught in Moving Parts.	Struck by Load.	Struck on Runway by Moving Crane.	Miscellaneous.
Printing and publishing establishments, . .	3	5	7	13	6	2	-	-	-	-	-	-
Carpet mills,	1	-	-	1	10	1	1	-	-	-	1	2
Cotton mills,	19	8	38	6	82	32	-	-	-	-	-	1
Dyeing and finishing textiles,	14	-	6	-	34	8	-	-	-	-	-	1
Hemp and jute mills,	1	-	-	-	3	2	-	-	-	-	-	1
Knitting mills,	-	1	3	-	9	-	-	-	-	-	-	-
Lace and embroidery makers,	-	-	-	-	-	-	-	-	-	-	-	-
Linen mills,	1	-	1	-	-	1	-	-	-	-	-	-
Print works,	4	2	4	-	11	7	-	-	-	-	-	-
Rope and cordage factories,	-	1	-	-	-	-	-	-	-	-	-	-
Sail, awning and tent makers,	-	-	-	-	-	-	-	-	-	-	-	-
Silk mills,	-	1	-	-	4	-	-	-	-	-	-	-
Woolen and worsted mills,	13	6	31	3	50	2	-	-	1	-	-	-
Not specified textile workers,	-	2	2	-	7	2	-	-	-	-	-	-
Broom and brush makers,	-	2	1	-	1	-	-	-	-	-	-	-
Button makers,	-	-	-	-	1	-	-	-	-	-	-	-
Charcoal and coke burners,	-	-	-	-	3	-	-	-	-	-	-	-
Cigars,	-	-	-	-	-	-	-	-	-	-	-	-
Electric light and power companies, . .	5	7	12	3	8	-	-	-	-	1	-	2
Electrical supplies,	20	27	43	72	25	-	1	1	19	27	-	10
Gas works,	2	23	22	3	38	-	-	-	1	6	-	1
Oil works,	1	-	-	-	-	-	-	-	-	-	-	-
Rubber factories,	5	12	30	1	21	-	-	-	1	-	-	2
Straw workers,	-	2	2	-	-	26	-	-	-	-	-	-
Gas and electric companies,	1	12	1	1	8	-	-	-	-	-	-	-
Other miscellaneous industries and occupations,	10	4	8	10	32	-	-	-	-	-	-	-

Workers in "not specified" manufacturing and mechanical industries,	8	14	13	4	15	—	—	1	—	—	—	2	—	1	—	—	—
Water transportation,	—	3	3	2	5	—	—	3	1	—	—	2	—	1	—	—	—
Construction and maintenance of streets, roads, sewers, bridges, etc.,	3	10	9	—	46	—	—	—	—	—	—	18	—	1	—	—	10
Livery stables,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Truck, transfer, cab and hack companies, . .	1	8	2	3	4	—	—	1	—	—	—	2	—	1	—	—	2
Street railways,	2	6	12	3	11	—	—	2	—	—	—	6	—	1	—	—	2
Steam railroads,	5	11	38	1	68	—	—	—	1	—	—	5	—	—	—	—	2
Express companies,	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Telegraph and telephone,	—	3	1	1	4	—	—	—	—	—	—	—	—	—	—	—	—
Other persons in transportation,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Banking and brokerage,	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Insurance,	—	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Real estate,	2	3	3	—	5	—	—	—	—	—	—	—	—	—	—	—	—
Wholesale and retail trade,	10	24	31	1	70	—	—	1	—	—	—	9	—	1	—	—	2
Elevators,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Warehouses and cold-storage plants, . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other persons in trade,	—	—	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Clerical assistants (industry, business or professional not specified),	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Professional service (all kinds),	4	5	7	—	32	—	—	—	—	—	—	—	—	—	—	—	—
Occupations not in industries,	1	24	8	—	139	—	—	—	—	—	—	—	—	—	—	—	—
Laundries and laundry work,	—	2	11	—	6	—	—	—	—	—	—	—	—	—	—	—	—
Total,	290	412	734	828	1,260	205	20	7	148	155	18	86					

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.											
	Drills.	ELECTRICITY.			ELEVATORS.							
		Flashes and Short Circuits.	Shocks.	Other Generator and Motor Accidents.	Caught in Machinery.	Caught between Car and Shaft.	Caught Underneath or on Top of Car.	Falling Car.	Falling down Shaft (Person).	Struck by Falling Object.	Caught by Fire Hatch or Trap.	Miscellaneous.
Printing and publishing establishments,	1	3	2	3	4	6	-	1	1	2	-	8
Carpet mills,	1	3	-	-	5	2	-	-	2	-	-	3
Cotton mills,	10	7	6	-	-	57	4	8	1	9	3	43
Dyeing and finishing textiles,	-	3	2	-	-	2	-	-	-	-	1	6
Hemp and jute mills,	3	-	2	-	1	-	-	-	-	-	-	-
Knitting mills,	-	-	1	-	1	4	1	-	1	1	-	3
Lace and embroidery makers,	-	-	-	-	-	-	-	-	-	-	-	-
Linen mills,	-	-	-	-	2	1	-	-	-	-	-	-
Print works,	-	1	-	-	1	6	-	-	1	-	-	6
Rope and cordage factories,	-	-	-	-	-	-	-	-	-	-	-	-
Sail, awning and tent makers,	-	-	-	-	-	-	-	-	-	-	-	-
Silk mills,	1	-	-	-	-	1	-	-	-	-	-	-
Woolen and worsted mills,	6	2	1	1	2	12	1	1	3	-	-	14
Not specified textile workers,	-	-	2	-	-	4	-	-	1	-	-	2
Broom and brush makers,	-	-	-	1	-	1	-	-	-	-	-	-
Button makers,	1	-	-	-	-	-	-	1	-	-	-	-
Charcoal and coke burners,	-	-	-	-	-	-	-	-	-	-	-	-
Cigars,	-	-	-	-	-	-	-	-	-	-	-	1
Electric light and power companies,	-	34	26	16	-	1	-	-	-	-	-	2
Electrical supplies,	51	30	16	10	2	3	1	-	-	1	-	3
Gas works,	3	3	-	1	-	1	3	-	-	-	-	3
Oil works,	-	-	1	-	-	-	1	-	-	-	-	-
Rubber factories,	3	2	1	4	3	7	1	-	-	2	-	5
Straw workers,	-	-	1	-	-	1	-	-	-	-	-	-
Gas and electric companies,	-	3	5	2	-	1	-	-	-	-	-	-
Other miscellaneous industries and occupations,	15	2	1	3	2	1	-	-	-	2	-	5

Workers in "not specified" manufacturing and mechanical industries, . . .	7	1	2	-	-	3	-	-	-	1	-	2	-	-	1	-	4
Water transportation, . . .	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Construction and maintenance of streets, roads, sewers, bridges, etc., . . .	12	4	8	5	-	-	-	-	-	-	-	-	3	-	-	-	1
Livery stables, . . .	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Truck, transfer, cab and hack companies, . .	10	51	37	10	-	-	-	-	-	-	-	-	-	-	-	-	8
Street railways, . . .	15	1	6	7	-	-	-	-	-	-	-	-	-	-	-	-	6
Steam railroads, . . .	-	7	4	1	-	-	-	-	-	-	-	-	-	-	-	-	4
Express companies, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Telegraph and telephone, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Other persons in transportation, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Banking and brokerage, . . .	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Insurance, . . .	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Real estate, . . .	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Wholesale and retail trade, . . .	1	7	2	3	-	-	-	-	-	-	-	-	-	-	-	-	16
Elevators, . . .	-	-	7	7	-	-	-	-	-	-	-	-	-	-	-	-	94
Warehouses and cold-storage plants, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
Clerical assistants (industry, business or profession not specified), . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Professional service (all kinds), . . .	1	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	4
Occupations not in industries, . . .	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	19
Laundries and laundry work, . . .	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Total, . . .	454	214	168	104	66	313	49	52	91	70	10	427	-	-	-	-	427

[illegible]

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.										
	EMERY WHEELS.		ENGINES.		EXCAVATING.			Explosions (Other than Boilers).	Ex-tractors (Cen- trifugal).	EYE INJURIES.	
	Burst- ing.	Cuts and Ab- rasions.	Caught in or struck by Moving Part.	Fly- wheel burst- ing.	Miscel- laneous.	Blasting and Drilling.	Cave-in.			Miscel- laneous.	Belling.	Chem- icals.
Other papers,	-	-	1	-	-	-	-	1	-	-	1
Printing and publishing establishments,	-	2	1	-	-	-	-	-	-	-	1
Carpet mills,	1	2	14	-	-	-	-	-	3	9	25
Cotton mills,	-	23	2	-	-	-	-	4	-	-	14
Dyeing and finishing textiles,	-	1	1	-	-	-	-	-	-	-	-
Hemp and jute mills,	-	-	1	-	-	-	-	-	1	1	-
Knitting mills,	-	2	-	-	-	-	-	-	-	-	-
Lace and embroidery makers,	-	-	-	-	-	-	-	-	-	-	-
Linen mills,	-	2	-	-	-	-	-	-	-	-	-
Print works,	-	-	1	-	-	-	-	-	-	-	6
Rope and cordage factories,	-	1	1	-	-	-	-	-	-	-	-
Sail, awning and tent makers,	-	-	1	-	-	-	-	-	-	-	-
Silk mills,	-	-	1	-	-	-	-	-	-	1	1
Woolen and worsted mills,	-	10	6	-	-	1	1	3	2	1	19
Not specified textile workers,	-	5	-	-	-	-	-	1	-	1	1
Broom and brush makers,	-	4	-	-	-	-	-	-	-	-	-
Button makers,	-	2	-	-	-	-	-	-	-	-	-
Charcoal and coke burners,	-	-	-	-	-	-	-	-	-	-	-
Cigars,	-	-	-	-	-	-	-	-	-	-	-
Electric light and power companies,	-	3	2	-	1	1	1	12	-	-	5
Electrical supplies,	4	65	-	-	-	2	5	15	-	-	15
Gas works,	-	-	1	-	-	-	-	3	-	-	3
Oil works,	-	-	-	-	-	2	-	10	-	-	7
Rubber factories,	1	-	2	-	-	-	-	3	-	-	1
Straw workers,	-	-	-	-	-	-	-	-	-	-	-
Gas and electric companies,	-	-	2	-	-	-	3	6	-	-	1

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.											
	EYE INJURIES — <i>Con.</i>						Falling Material from Overhead.	FALLS.				
	Electric Flash.	Emery Wheels.	Flying Particles from Hand Tools.	Lubricator and Gage Glasses.	Machine Tools (including Portable Tools).	Molten Metal.		Miscellaneous.	From Fixed Ladders.	Into Holes, Pits, etc.	Over Obstructions.	From Permanent Structures.
Agriculture,	-	-	-	-	-	-	-	4	-	1	1	-
Forestry,	-	-	-	-	-	-	-	2	-	-	-	-
Animal husbandry,	-	-	-	-	-	-	-	-	-	1	-	1
Ice harvesting,	-	-	-	-	-	-	-	4	-	-	-	-
Mining,	-	-	1	-	4	-	-	1	-	-	4	-
Quarrying,	-	-	48	-	4	-	31	22	-	2	-	-
Building and hand trades,	1	34	56	-	4	1	170	505	-	96	-	80
Fertilizer makers,	-	-	-	-	-	-	1	2	-	1	-	-
Paint makers,	-	-	-	-	-	-	1	-	-	-	-	-
Powder, cartridge, fireworks, etc., makers,	-	-	-	-	-	-	2	-	-	-	-	-
Soap makers,	-	-	1	-	-	-	-	-	-	-	1	1
Other chemical workers,	-	-	2	-	-	1	18	9	-	4	6	-
Brick makers,	-	-	1	-	-	-	4	5	-	1	-	1
Potteries,	-	-	-	-	-	-	-	-	-	1	-	1
Tile makers,	-	-	1	-	2	-	-	-	-	-	-	-
Glass makers, workers,	-	-	1	-	-	1	2	1	-	1	1	-
Terra-cotta workers,	-	-	1	-	-	-	1	1	-	-	-	-
Lime, cement and gypsum,	-	-	1	-	2	-	24	4	-	2	-	-
Marble and stone cutters,	1	1	42	-	-	-	3	2	-	-	1	-
Clothing makers,	-	-	-	-	-	-	2	1	-	-	1	-
Corset makers,	-	-	-	-	-	-	-	-	-	-	-	-
Glove makers,	-	-	-	-	-	-	-	-	-	-	-	-
Hat makers (wool or felt),	-	-	-	-	-	-	1	-	-	-	-	-
Shirt, collar and cuff makers,	-	-	1	-	-	-	1	-	-	-	-	-
Bakeries,	-	2	3	-	-	-	5	6	-	1	3	1
Butter and cheese makers,	-	-	-	-	-	-	-	-	-	-	-	-
Candy,	1	-	1	-	-	-	-	3	-	-	3	-
Fish curers and packers,	-	-	-	-	-	-	4	1	-	-	-	1

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.									
	EYE INJURIES — <i>Con.</i>					Falling Material from Overhead.	FALLS.			
	Electric Flash.	Emery Wheels.	Flying Particles from Hand Tools.	Lubricator and Gage Glasses.	Machine Tools (including Portable Tools).	Molten Metal.	Miscellaneous.	From Fixed Ladders, etc.	Into Holes, Pits, etc.	Over Obstructions.
Other papers,	—	—	—	—	—	—	5	—	—	—
Printing and publishing establishments,	1	6	1	—	—	—	12	—	1	1
Carpet mills,	—	4	1	—	—	—	6	—	3	3
Cotton mills,	—	—	1	—	1	—	130	—	1	1
Dyeing and finishing textiles,	4	104	25	1	14	1	49	—	19	4
Hemp and jute mills,	—	2	—	—	—	—	12	3	8	2
Knitting mills,	—	6	4	—	3	—	9	—	2	1
Lace and embroidery makers,	—	10	4	—	1	—	3	—	1	—
Linen mills,	—	4	—	—	—	—	—	—	—	—
Print works,	—	2	1	—	—	—	1	—	—	1
Rope and cordage factories,	2	2	—	—	—	—	6	—	1	—
Sail, awning and tent makers,	—	1	—	—	—	—	4	—	—	—
Silk mills,	—	—	—	—	—	—	2	—	2	—
Woolen and worsted mills,	—	2	—	—	—	2	—	—	—	—
Not specified textile workers,	—	32	17	1	5	1	72	—	19	1
Broom and brush makers,	—	10	1	—	—	—	9	—	2	—
Button makers,	—	—	—	—	—	—	—	—	—	—
Charcoal and coke burners,	—	—	1	—	—	—	14	—	—	—
Cigars,	—	—	—	—	—	—	—	—	—	—
Electric light and power companies,	4	1	5	—	2	4	1	—	1	—
Electrical supplies,	9	226	62	1	45	29	32	1	4	6
Gas works,	2	2	13	1	—	—	275	2	9	3
Oil works,	—	—	1	—	—	—	55	—	11	—
Rubber factories,	2	—	12	1	6	1	—	1	6	—
Straw workers,	—	31	—	—	—	1	26	—	1	2
Gas and electric companies,	1	—	3	—	—	1	8	—	3	5

Other miscellaneous industries and occupations, "not specified," manufacturing and mechanical industries, . . .	38	5	-	8	-	24	9	-	2	2	2	-
Water transportation, . . .	14	4	-	5	2	27	10	-	1	4	4	1
Construction and maintenance of streets, roads, sewers, bridges, etc., . . .	2	9	2	4	-	16	43	4	32	13	13	2
Livery stables, . . .	-	26	1	1	2	64	139	-	37	19	19	7
Truck, transfer, cab and hack companies, . .	5	3	-	2	1	1	12	-	3	3	3	2
Street railways, . . .	20	26	-	3	6	15	24	-	6	19	19	2
Steam railroads, . . .	34	43	1	17	1	157	58	1	20	46	46	13
Express companies, . . .	1	1	-	-	1	2	6	1	4	2	2	2
Telegraph and telephone, . . .	1	1	-	-	1	3	2	-	2	2	2	2
Other persons in transportation, . . .	1	-	-	-	-	-	-	-	-	-	-	-
Banking and brokerage, . . .	-	-	-	-	-	-	-	-	-	-	-	-
Insurance, . . .	-	-	-	-	-	-	-	-	-	-	-	-
Real estate, . . .	1	16	-	-	-	1	1	-	-	1	1	1
Wholesale and retail trade, . . .	5	-	-	2	1	4	9	1	33	67	67	15
Elevators, . . .	-	-	-	-	-	109	122	-	1	1	1	-
Warehouses and cold-storage plants, . . .	-	-	-	-	-	5	5	-	1	1	1	-
Other persons in trade, . . .	-	-	-	-	-	1	2	-	-	-	-	-
Clerical assistants (industry, business or professional not specified), . . .	-	-	-	-	-	-	-	-	-	-	-	-
Professional service (all kinds), . . .	-	1	-	-	-	5	8	-	7	10	10	1
Occupations not in industries, . . .	-	-	-	1	-	19	16	-	11	13	13	5
Laundries and laundry work, . . .	-	-	-	-	-	1	4	-	3	3	3	-
Total, . . .	76	791	17	330	222	2,727	1,502	15	499	627	627	177

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.											
	FALLS — <i>Con.</i>					Gears.	GLASS.		HAND LABOR.			
	From Poles.	From or with Portable Ladders.	From Scat-folding, etc.	Slipping on Floor Level.	Down Stairways.		Miscellaneous.	Bottles and Miscellaneous.	Win-	Caught by Material.	Flying Particles from Hammering Tools.	Slivers, Sharp Edges, Corners, etc.
								dows.				
Agriculture,	—	3	1	1	3	10	2	2	1	7	—	8
Forestry,	—	1	—	—	—	17	—	—	—	11	—	10
Animal husbandry,	—	—	—	—	—	5	—	—	—	1	—	1
Ice harvesting,	—	1	—	5	—	37	—	—	—	26	—	14
Mining,	—	—	—	—	—	—	—	—	—	—	—	—
Quarrying,	—	1	—	1	—	23	1	—	—	2	—	—
Building and hand trades,	11	228	467	41	55	427	12	30	15	99	40	38
Fertilizer makers,	—	3	—	—	—	5	—	—	—	1,278	63	638
Paint makers,	—	—	—	4	—	1	3	—	—	20	—	6
Powder, cartridge, fireworks, etc., makers,	—	—	—	—	—	1	—	—	—	—	—	3
Soap makers,	—	2	—	1	1	1	—	—	—	8	—	—
Other chemical workers,	—	3	1	7	5	30	1	51	1	87	4	54
Brick makers,	—	—	1	—	1	9	1	—	—	9	—	1
Potteries,	—	—	1	—	1	1	—	—	—	3	—	7
Tile makers,	—	—	—	—	—	1	—	—	—	3	—	—
Glass makers, workers,	—	1	2	2	—	1	24	12	1	9	—	4
Terra-cotta workers,	—	—	—	1	—	3	—	—	—	2	—	2
Lime, cement and gypsum,	—	—	1	2	—	12	3	—	—	18	—	6
Marble and stone cutters,	—	3	3	1	2	6	3	—	1	58	19	12
Clothing makers,	—	1	—	6	5	2	—	1	3	3	—	36
Corset makers,	—	1	—	1	1	2	—	—	1	1	—	19
Glove makers,	—	—	—	—	—	3	—	—	—	—	—	—
Hat makers (wool or felt),	—	—	—	1	—	—	—	—	—	3	—	5
Shirt, collar and cuff makers,	—	—	—	1	—	1	—	—	—	1	—	18
Bakeries,	—	2	1	14	12	13	4	12	28	90	1	111
Butter and cheese makers,	—	—	—	—	—	—	—	—	—	—	—	—
Candy,	—	6	—	17	11	2	—	4	—	38	1	48
Fish curers and packers,	—	1	—	1	—	10	2	—	1	4	—	30

Flour and grain mills,	Flour and vegetable canners, picklers, pre- serves,	Slaughter and packing houses,	Sugar makers and refiners,	Other food preparers,	Agricultural implements,	Automobile factories,	Car and railroad shops,	Foundries and metal working,	Iron and steel mills,	Ship and boat building,	Wagons and carriages,	Other iron and steel workers,	Harness and saddle makers and repairers,	Leather belt, leather case and pocketbook makers,	Shoes,	Tanneries,	Trunk makers,	Breweries,	Disstilleries,	Other liquor and beverage workers,	Box makers (wood),	Furniture,	Pianos and organs,	Saw and planing mills,	Other woodworkers,	Brass mills,	Clock factories,	Copper factories,	Gold and silver workers,	Jewelry factories,	Lead and zinc factories,	Tin-plate factories,	Watch factories,	Brass and copper,	Box makers (paper),	Makers of blank books, envelopes, tags, paper bags, etc.,	Paper mills,	Pulp mills,
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TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.											
	FALLS — <i>Con.</i>						GLASS.		HAND LABOR.			
							Gears.	Bottles and Miscellaneous.	Win- dows.	Caught by Ma- terial.	Flying Particles from Ham- mering Tools.	Slivers, Sharp Edges, Corners, etc.
	From Poles.	From or with Portable Ladders.	From Scaf- folding, etc.	Slipping on Floor Level.	Down Stair- ways.	Miscel- laneous.						
Other papers,	—	2	2	3	3	13	6	1	1	27	—	17
Printing and publishing establishments,	—	4	—	23	20	22	15	6	3	73	—	83
Carpet mills,	—	6	1	9	3	11	11	2	—	12	1	35
Cotton mills,	—	71	23	275	87	156	430	70	77	615	17	1,156
Dyeing and finishing textiles,	—	8	1	19	4	34	10	5	5	69	1	54
Hemp and jute mills,	—	5	1	8	2	16	9	1	1	51	2	68
Knitting mills,	—	2	1	11	4	11	15	1	4	17	—	21
Lace and embroidery makers,	—	—	—	—	—	—	—	—	—	2	—	7
Linen mills,	—	2	—	6	3	3	5	—	—	7	1	91
Print works,	—	8	2	23	2	15	18	5	2	44	1	7
Rope and cordage factories,	—	—	—	4	—	1	7	—	—	7	1	4
Sail, awning and tent makers,	—	2	—	—	—	—	—	—	—	—	—	15
Silk mills,	—	—	—	6	—	3	11	—	2	11	—	399
Woolen and worsted mills,	1	36	8	131	39	105	211	14	24	245	5	102
Not specified textile workers,	—	5	2	19	5	21	31	5	6	40	—	71
Broom and brush makers,	—	1	1	1	1	1	—	2	—	6	—	3
Button makers,	—	—	1	1	1	1	—	—	1	—	—	—
Charcoal and coke burners,	—	—	—	—	—	1	—	—	—	—	—	—
Gigars,	—	—	—	—	3	—	1	—	1	4	—	14
Electric light and power companies,	23	29	2	—	14	36	12	23	2	121	6	117
Electrical supplies,	—	12	4	27	10	81	32	32	4	498	25	542
Gas works,	1	15	1	10	20	62	2	7	3	167	10	103
Oil works,	1	—	—	—	—	2	—	1	—	6	—	5
Rubber factories,	—	14	2	26	15	47	10	11	4	427	5	381
Straw workers,	—	1	—	—	—	—	—	—	—	3	—	5
Gas and electric companies,	5	6	3	3	4	19	4	3	1	35	2	23

Other miscellaneous industries and occupations, in "not specified" manufacturing and mechanical industries, . . .	10	1	12	8	14	6	55	3	104	3	144
Water transportation, . . .	12	5	4	7	22	7	10	1	71	1	126
Construction and maintenance of streets, roads, sewers, bridges, etc., . . .	11	16	20	3	124	1	1	2	419	6	106
Livery stables, . . .	14	52	7	9	163	7	6	1	524	31	156
Truck, transfer, cab and hack companies, . . .	1	—	6	2	3	—	—	—	10	—	7
Street railways, . . .	5	—	11	14	72	11	5	2	334	3	84
Steam railroads, . . .	23	12	17	13	108	9	21	59	244	35	92
Express companies, . . .	37	19	27	11	178	6	36	13	952	72	373
Telegraph and telephone, . . .	4	—	13	10	59	—	1	1	226	—	40
Other persons in transportation, . . .	1	—	1	5	25	—	6	1	26	1	16
Banking and brokerage, . . .	23	—	1	1	2	—	2	—	6	—	3
Insurance, . . .	—	—	4	4	2	—	2	—	—	—	3
Real estate, . . .	—	—	3	7	2	—	—	—	1	—	7
Wholesale and retail trade, . . .	13	3	7	19	15	—	7	2	19	2	22
Elevators, . . .	97	16	166	220	499	12	278	20	1,033	12	1,300
Warehouses and cold-storage plants, . . .	—	—	4	—	—	—	—	—	2	—	—
Other persons in trade, . . .	1	—	2	1	12	3	1	—	68	1	29
Clerical assistants (industry, business or profession not specified), . . .	—	1	4	4	4	—	1	2	6	—	10
Professional service (all kinds), . . .	—	—	1	—	—	—	—	—	—	—	—
Occupations not in industries, . . .	21	5	26	20	31	1	19	1	25	—	39
Laundries and laundry work, . . .	32	8	94	99	46	—	91	11	87	1	259
Total, . . .	2	—	8	9	6	3	2	2	5	—	10
Total, . . .	79	738	1,508	974	3,368	1,228	1,062	416	11,978	553	11,900

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.									
	HAND LABOR — <i>Con.</i>		HOISTS.			Illness.	Infection from Trivial Cuts, Burns, etc.	Intoxication.	LATIES.	
	Strains from Lifting, etc.	Struck by Tools.	Breaking Parts.	Falling Loads.	Miscellaneous.				Wood-working.	Metal Working.
Agriculture,	7	8	—	—	—	—	3	—	—	—
Forestry,	6	19	—	—	—	—	1	1	—	—
Animal husbandry,	—	1	—	—	—	—	1	—	—	—
Ice harvesting,	1	18	—	—	—	—	1	—	—	—
Mining,	—	—	—	—	—	—	—	—	—	—
Quarrying,	12	21	2	1	2	—	6	1	—	—
Building and hand trades,	211	498	14	24	80	17	187	2	2	—
Fertilizer makers,	2	6	—	3	1	—	2	—	—	—
Paint makers,	6	1	—	—	—	—	—	—	—	—
Powder, cartridge, fireworks, etc., makers,	1	1	—	—	—	1	—	—	—	—
Soap makers,	1	4	—	—	—	2	6	—	—	—
Other chemical workers,	18	18	—	1	3	—	14	—	—	—
Brick makers,	2	6	—	—	—	—	1	—	—	—
Potteries,	—	—	—	—	—	—	1	—	—	—
Tile makers,	—	—	—	—	—	—	—	—	—	—
Glass makers, workers,	3	2	—	—	—	—	8	—	—	—
Terra-cotta workers,	—	1	—	—	—	—	1	—	—	—
Lime, cement and gypsum,	3	2	—	—	1	—	3	—	—	—
Marble and stone cutters,	9	13	2	1	1	7	15	—	—	—
Clothing makers,	5	4	—	—	—	—	2	—	—	—
Corset makers,	1	3	—	—	—	—	—	—	—	—
Glove makers,	—	1	—	—	—	—	—	—	—	—
Hat makers (wool or felt),	—	—	—	—	—	—	2	—	—	—
Shirt, collar and cuff makers,	2	—	—	—	—	—	—	—	—	—
Bakeries,	19	10	—	—	—	1	23	—	—	—
Butter and cheese makers,	—	—	—	—	—	—	—	—	—	—
Candy,	27	7	—	—	—	2	32	—	—	—
Fish curers and packers,	2	2	—	—	—	—	4	—	—	—

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.											
	HAND LABOR — Con.		HOISTS.			Illness.	Infection from Trivial Cuts, Burns, etc.	Intoxication.	LATHES.		Milling Machines.	Miscellaneous (Unclassified).
	Strains from Lifting, etc.	Struck by Tools.	Break- ing Parts.	Falling Loads.	Miscellaneous.				Wood- working.	Metal Work- ing.		
Other papers,	5	2	1	1	1	1	7	—	—	—	8	
Printing and publishing establishments,	22	7	—	2	1	2	40	—	1	—	41	
Carpet mills,	4	5	1	—	—	—	7	—	1	—	20	
Cotton mills,	159	115	4	6	7	25	172	4	21	—	273	
Dyeing and finishing textiles,	26	11	2	1	3	3	13	—	2	—	35	
Hemp and jute mills,	9	6	2	—	—	—	65	—	1	—	18	
Knitting mills,	14	8	—	—	—	3	9	—	—	—	23	
Lace and embroidery makers,	—	—	—	—	—	—	1	—	—	—	—	
Linen mills,	4	2	—	—	—	—	3	—	1	—	8	
Print works,	14	6	1	1	1	2	12	—	—	—	18	
Rope and cordage factories,	3	—	—	—	3	—	1	—	—	—	5	
Sail, awning and tent makers,	—	—	—	—	—	—	3	—	—	—	—	
Silk mills,	3	3	—	—	1	1	1	—	—	—	—	
Woolen and worsted mills,	84	62	2	—	6	9	3	1	—	—	10	
Not specified textile workers,	13	11	3	—	2	—	107	2	8	1	127	
Broom and brush makers,	—	—	—	—	—	—	18	4	2	—	13	
Button makers,	2	2	—	—	—	—	2	4	1	—	4	
Charcoal and coke burners,	—	—	—	—	—	—	1	—	2	—	—	
Cigars,	2	1	—	—	—	—	2	—	—	—	—	
Electric light and power companies,	46	55	3	1	4	1	17	—	1	—	78	
Electrical supplies,	98	175	5	7	4	10	132	1	106	27	121	
Gas works,	32	85	3	21	15	7	17	—	4	—	84	
Oil works,	1	—	1	—	—	—	—	—	—	—	—	
Rubber factories,	69	77	1	1	2	6	39	1	11	11	92	
Straw workers,	1	3	—	—	—	—	6	1	—	—	4	
Gas and electric companies,	5	20	—	—	4	3	10	1	2	—	18	

Other miscellaneous industries and occupations,	12	39	-	2	2	10	31	-	3	13	12	24
Workers in "not specified" manufacturing and mechanical industries,	19	26	-	-	2	5	30	-	1	11	8	31
Water transportation,	27	47	4	26	63	-	24	2	-	1	-	126
Construction and maintenance of streets, roads, sewers, bridges, etc.,	68	213	4	19	37	3	57	4	-	-	-	112
Livery stables,	2	2	-	-	1	-	1	-	-	-	-	6
Truck, transfer, cab and hack companies,	83	33	1	4	8	2	42	6	-	4	-	61
Street railways,	75	139	-	6	11	12	39	2	-	3	1	121
Steam railroads,	95	409	1	4	6	6	42	-	-	20	1	231
Express companies,	72	2	-	-	1	1	9	-	-	-	-	35
Telegraph and telephone,	23	10	-	-	1	-	3	-	-	-	-	22
Other persons in transportation,	1	-	-	-	-	-	-	-	-	1	-	3
Banking and brokerage,	-	1	-	-	-	-	-	-	-	-	-	8
Insurance,	1	11	-	-	-	1	5	-	-	-	-	13
Real estate,	11	11	1	-	1	1	14	-	-	-	-	23
Wholesale and retail trade,	310	301	7	30	47	17	359	3	2	5	-	655
Elevators,	-	-	-	-	-	-	-	-	-	-	-	1
Warehouses and cold-storage plants,	19	10	-	2	-	1	6	1	-	-	-	16
Other persons in trade,	5	1	-	-	3	-	1	-	-	-	-	3
Clerical assistants (industry, business or profession not specified),	-	-	-	-	-	-	-	-	-	-	-	-
Professional service (all kinds),	22	12	-	-	-	1	26	1	-	1	-	40
Occupations not in industries,	38	19	-	-	2	4	92	1	-	-	-	103
Laundries and laundry work,	3	3	-	-	1	-	7	-	-	-	-	9
Total,	2,625	3,917	81	213	410	244	3,175	26	104	834	319	4,003

[illegible]

TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.											
	NAILS.		Planers (Metal).	Playing and Footling.	Portable Tools (Other than Rock Drills).	PRESSES.			RAILROAD EQUIPMENT.			
	In Boxes, Barrels or Objects.	On Floor or Ground.				Drill Presses.	Print- ing.	Punch and Drop Miscel- laneous Presses.	Caught in Frogs, Switches, etc.	Coup- ling or un- coupling Cars.	Falls from Cars or Loco- motives.	Falls from Trestles.
Other papers.	4	4	-	-	-	-	1	8	9	-	-	-
Printing and publishing establishments.	7	11	1	-	1	-	1	137	17	-	-	-
Carpet mills.	3	4	-	-	-	-	-	-	-	-	-	-
Cotton mills.	70	237	1	4	-	-	-	2	9	-	2	1
Dyeing and finishing textiles.	4	7	1	-	-	-	-	1	3	-	1	1
Hemp and jute mills.	1	6	-	-	-	-	-	-	2	-	1	1
Knitting mills.	5	10	-	-	-	-	-	1	4	-	-	-
Lace and embroidery makers.	-	-	-	-	-	-	-	-	-	-	-	-
Linen mills.	-	4	-	-	-	-	-	-	-	-	-	-
Print works.	4	5	-	2	-	-	-	-	1	-	-	-
Rope and cordage factories.	-	1	-	-	-	-	-	-	-	-	1	-
Sail, awning and tent makers.	-	1	-	-	-	-	-	-	-	-	-	-
Silk mills.	-	-	-	-	-	-	-	1	1	-	-	-
Woolen and worsted mills.	22	36	-	4	-	-	-	-	13	-	-	-
Not specified textile workers.	6	10	-	2	-	-	-	2	7	-	-	-
Broom and brush makers.	5	7	-	-	-	-	-	-	1	-	-	-
Button makers.	1	-	-	-	-	-	-	-	12	-	-	-
Charcoal and coke burners.	-	-	-	-	-	-	-	-	-	-	-	-
Cigars.	-	3	-	-	-	-	-	1	-	-	-	-
Electric light and power companies.	13	12	-	1	-	-	1	-	-	-	-	-
Electrical supplies.	43	52	4	-	2	-	37	-	95	1	1	1
Gas works.	13	20	-	-	1	-	2	-	1	1	-	-
Oil works.	1	-	-	-	-	-	-	-	-	-	-	-
Rubber factories.	23	47	-	-	-	-	2	2	-	-	1	-
Straw workers.	1	1	-	-	-	-	-	-	31	-	-	-
Gas and electric companies.	2	5	-	-	-	-	-	-	5	-	-	-

Other miscellaneous industries and occupations,	8	6	3	-	-	-	-	-	2	2	112	-	-	-	-	-
Workers in "not specified" manufacturing and mechanical industries,	21	16	-	-	-	-	-	-	-	2	51	-	-	-	-	-
Water transportation,	28	17	-	2	-	-	-	-	1	-	-	1	3	-	-	-
Construction and maintenance of streets, roads, sewers, bridges, etc.,	62	82	-	-	-	-	-	7	-	-	-	3	4	3	-	-
Livery stables,	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Truck, transfer, cab and hack companies,	20	29	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Street railways,	12	22	-	-	-	-	-	3	7	-	2	-	-	-	-	-
Steam railroads,	39	60	5	1	-	-	-	6	6	-	4	76	290	6	-	-
Express companies,	28	11	-	-	-	-	-	-	-	-	5	-	1	-	-	-
Other persons in transportation,	1	2	-	-	-	-	-	-	1	5	-	-	-	-	-	-
Telegraph and telephone,	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other persons in transportation,	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Banking and brokerage,	1	1	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Insurance,	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Real estate,	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wholesale and retail trade,	223	229	-	1	-	-	-	1	-	2	9	2	8	-	-	-
Elevators,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Warehouses and cold-storage plants,	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other persons in trade,	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clerical assistants (industry, business or profession not specified),	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Professional service (all kinds),	7	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occupations not in industries,	19	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laundries and laundry work,	-	3	-	-	-	-	-	-	-	1	5	-	-	-	-	-
Total,	1,490	2,167	75	30	52	171	224	1,024	56	92	317	10	-	-	-	-

Flour and grain mills,																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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TABLE III. — *Non-fatal Accidents, classified by Industries and by Causes, etc.* — Continued.

INDUSTRIES.	CAUSE.										Acci- dents caused by Ma- chinery pecu- liar to Special Indus- tries.
	RAILROAD EQUIPMENT — <i>Con.</i>				Saws.	Shaft- ing, Set Screws, Coup- lings, etc.	VEHICLES.			Wood Molders, Shapers, Mortis- ing Ma- chines, etc.	
	Hoisting and convey- ing Outfits.	Struck or run over by Loco- motive.	Colli- sions.	Miscel- laneous.			Animal- drawn.	Self- pro- pelled.	Trucks, Wheel- barrows, etc.			Colli- sions between Vehicles.
Other papers.	-	-	-	-	7	1	-	-	4	-	83
Printing and publishing establishments,	-	-	-	-	33	5	9	5	15	1	163
Carpet mills,	-	-	-	-	-	188	1	-	4	-	132
Cotton mills,	-	1	1	-	50	6	14	12	160	19	2,067
Dyeing and finishing textiles,	-	-	-	-	11	2	5	2	18	4	152
Hemp and jute mills,	-	-	-	-	3	2	2	2	5	-	111
Knitting mills,	-	-	-	-	5	6	4	-	3	-	174
Lace and embroidery makers,	-	-	-	-	-	-	-	-	-	-	2
Linen mills,	-	-	-	-	3	1	1	-	7	-	31
Print works,	-	-	-	-	1	7	-	1	13	-	109
Rope and cordage factories,	-	-	-	-	-	-	2	3	1	-	21
Sail, awning and tent makers,	-	-	-	-	-	-	1	-	-	-	2
Silk mills,	-	-	-	-	2	4	-	-	-	-	22
Woolen and worsted mills,	-	-	-	-	19	65	9	7	73	-	961
Not specified textile workers,	-	-	-	-	5	13	2	1	15	-	156
Broom and brush makers,	-	-	1	-	4	1	1	-	-	-	23
Button makers,	-	-	-	-	38	1	-	1	-	-	28
Charcoal and coke burners,	-	-	-	-	-	-	-	-	-	-	-
Cigars,	-	-	-	-	-	-	-	-	-	-	2
Electric light and power companies,	-	-	-	-	2	4	27	34	5	-	14
Electrical supplies,	-	-	1	1	56	24	7	2	37	13	207
Gas works,	-	-	3	3	3	6	32	28	40	1	14
Oil works,	-	-	-	-	-	-	-	1	-	-	-
Rubber factories,	-	-	-	-	11	16	3	11	92	1	296
Straw workers,	-	-	-	-	2	-	-	-	2	-	9
Gas and electric companies,	-	-	-	-	1	-	8	10	3	-	4

Other miscellaneous industries and occupations,	-	-	-	-	-	5	7	2	4	-	27	143
Workers in "not specified" manufacturing and mechanical industries,	-	-	-	-	1	6	10	3	7	-	13	147
Water transportation,	-	-	-	-	-	2	7	6	123	-	1	14
Construction and maintenance of streets, roads, sewers, bridges, etc.,	13	-	17	7	-	2	150	35	27	5	2	20
Livery stables,	-	-	-	-	-	1	18	4	1	1	-	-
Truck, transfer, cab and hack companies,	-	-	-	-	-	1	316	4	24	5	1	6
Street railways,	-	-	2	2	-	1	38	112	13	2	7	23
Steam railroads,	8	112	488	1	-	7	3	4	100	-	1	55
Express companies,	-	-	-	-	-	-	120	34	74	1	1	2
Telegraph and telephone,	-	-	-	-	-	-	3	1	3	1	-	-
Other persons in transportation,	-	-	-	-	-	-	4	1	1	-	-	2
Banking and brokerage,	-	-	-	-	-	-	1	-	1	-	-	2
Insurance,	-	-	-	-	-	-	1	-	1	-	-	-
Real estate,	-	-	-	-	-	-	1	1	5	-	-	2
Wholesale and retail trade,	-	-	10	-	-	5	722	230	96	39	15	186
Elevators,	-	-	-	-	-	-	-	2	-	-	-	-
Warehouses and cold-storage plants,	-	-	-	-	-	-	6	-	27	-	-	4
Other persons in trade,	-	-	-	-	-	-	8	1	1	-	-	1
Clerical assistants (industry, business or profession not specified),	-	-	-	-	-	-	-	-	-	-	-	-
Professional service (all kinds),	-	-	-	-	-	-	8	5	4	-	5	18
Occupations not in industries,	-	-	-	-	-	1	12	8	4	2	-	65
Laundries and laundry work,	-	-	-	-	-	2	16	3	4	-	-	41
Total,	10	128	199	533	1,603	721	1,957	823	1,562	80	708	10,444

[illegible]

	1	1	1	1	1	1	1	2	3	10	2	2	2
Other liquor and beverage workers,													
Box makers (wood),													
Furniture,													
Pianos and organs,													
Other woodworkers,										1			
Copper factories,													
Other metal workers,													
Paper mills,							1						
Other papers,													
Printing and publishing establishments,													
Carpet mills,													
Cotton mills,													
Dyeing and finishing textiles,													1
Hemp and jute mills,													
Knitting mills,												1	
Woolen and worsted mills,													
Not specified textile workers,													
Electric light and power companies,													
Electrical supplies,										2			1
Gas works,													
Rubber factories,													
Tobacco,													
Gas and electric companies,													
Other miscellaneous industries and occupations,													
Workers in "not specified" manufacturing and mechanical industries,													
Water transportation,													
Construction and maintenance of streets, roads, sewers, bridges, etc.,													
Livery stables,													2
Truck, transfer, cab and hack companies,													
Street railways,													
Steam railroads,											1		
Express companies,													
Telegraph and telephone,											1		
Banking and brokerage,													
Real estate,													
Wholesale and retail trade,													1
Warehouses and cold-storage plants,													
Professional service (all kinds),													
Occupations not in industries,													1
Laundries and laundry work,													
Total,	3	25	1	1	1	1	1	1	1	2	10	3	2

	1	2	4	24	1	8	2	1	17	1	3	2
Other liquor and beverage workers,												
Box makers (wood),												
Furniture,												
Pianos and organs,												
Other woodworkers,												
Copper factories,												
Other metal workers,					1							
Paper mills,												
Other papers,												
Printing and publishing establishments,						1			2			
Carpet mills,						1						
Cotton mills,				1								
Dyeing and finishing textiles,												
Hemp and jute mills,												
Knitting mills,									1			
Woolen and worsted mills,												
Not specified textile workers,												
Electric light and power companies,			4	11								
Electrical supplies,												
Gas works,									1			
Gas works,												
Rubber factories,												
Tobacco,				3								
Gas and electric companies,												
Other miscellaneous industries and occupations,												
Workers in "not specified" manufacturing and mechanical industries,												
Water transportation,												
Construction and maintenance of streets, roads, sewers, bridges, etc.,											3	
Livery stables,												
Truck, transfer, cab and hack companies,				1					1			
Street railways,												
Steam railroads,				1								
Express companies,												
Telegraph and telephone,				2								
Banking and brokerage,						1						
Real estate,						1						
Wholesale and retail trade,						1	1		3			
Warehouses and cold-storage plants,									4			
Professional service (all kinds),												
Occupations not in industries,						1			1			
Laundries and laundry work,				1								
Total,	1	2	4	24	1	8	2	1	17	1	3	2

TABLE IV. — *Fatal Accidents classified, etc.* — Continued.

INDUSTRIES.	CAUSE.						
	HAND LABOR.			HOISTS.			Illness.
	Caught by Material.	Slivers, Sharp Edges, Corners, etc.	Strains from Lifting, etc.	Struck by Tools.	Breaking Parts.	Falling Loads.	Miscellaneous.
Agriculture,	1	—	—	—	—	—	—
Forestry,	—	—	—	—	—	—	—
Animal husbandry,	—	—	—	—	—	—	—
Ice harvesting,	—	—	—	—	—	—	—
Quarrying,	1	—	—	—	—	—	—
Building and hand trades,	3	—	—	—	1	2	2
Fertilizer makers,	—	—	—	—	—	—	—
Paint makers,	—	—	—	—	—	—	—
Powder, cartridge, fireworks, etc., makers,	—	—	—	—	—	—	—
Soap makers,	1	—	—	—	—	—	—
Other chemical workers,	—	—	—	—	—	—	1
Brick makers,	—	—	—	—	—	—	—
Marble and stone cutters,	—	—	—	—	—	—	—
Rakeries,	—	—	—	—	—	—	—
Fish curers and packers,	—	—	—	—	—	—	—
Slaughter and packing houses,	—	—	—	—	—	—	—
Other food preparers,	—	—	—	—	—	—	—
Foundries and metal working,	1	1	—	—	1	1	—
Iron and steel mills,	—	—	—	—	—	—	—
Ship and boat building,	1	—	—	—	—	—	—
Wagons and carriages,	—	—	—	—	—	—	—
Other iron and steel workers,	1	—	—	1	—	—	1
Leather belt, leather case and pocketbook makers,	—	—	—	—	—	—	—
Shoes,	—	—	—	—	—	—	—
Tanneries,	—	—	—	—	—	—	—
Trunk makers,	—	—	—	—	—	—	—
Breweries,	—	—	—	—	—	—	—
Other liquor and beverage workers,	—	—	—	—	—	—	—
Box makers (wood),	—	—	—	—	—	—	—
Furniture,	—	—	—	—	—	—	—

Pianos and organs,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other woodworkers,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Copper factories,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other metal workers,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Paper mills,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other papers,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Printing and publishing establishments,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carpet mills,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cotton mills,	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Dyeing and finishing textiles,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hemp and jute mills,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Knitting mills,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Woolen and worsted mills,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Not specified textile workers,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Electric light and power companies,	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Electrical supplies,	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gas works,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rubber factories,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tobacco,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gas and electric companies,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Other miscellaneous industries and occupations,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Workers in "not specified" manufacturing and mechanical industries,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Water transportation,	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Construction and maintenance of streets, roads, sewers, bridges, etc.,	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Livery stables,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Truck, transfer, cab and hack companies,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Street railways,	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Express companies,	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Telegraph and telephone,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Banking and brokerage,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Real estate,	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wholesale and retail trade,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Warehouses and cold-storage plants,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Professional service (all kinds),	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Occupations not in industries,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Laundries and laundry work,	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Total,	18	2	3	1	3	5	8	2	23	1	10	1	1	1	1	1	1	1	1

[illegible]

[illegible]

TABLE V. — *Percentage of Accidents reported to Number of Employees in the Principal Industries of the State, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	Average Number of Employees.	Number of Accidents.	Percentage of Accidents to Number of Employees.
Cotton mills,	115,837	7,773	6.7
Boots and shoes,	89,538	4,813	5.3
Woolen and worsted mills,	50,195	3,392	6.7
Foundries and metal working,	42,928	9,934	23.1
Electrical supplies,	22,437	3,754	16.7
Rubber factories,	16,461	2,127	12.9
Paper and pulp mills,	15,981	1,549	9.6
Clothing makers,	12,341	271	2.1
Dyeing and finishing textiles,	11,741	673	5.7
Tanneries,	10,929	1,297	11.8
Knitting mills,	10,747	469	4.3
Furniture,	9,120	922	10.1
Jewelry factories,	7,573	411	5.4
Printing and publishing,	7,561	908	12.0
Candy,	7,225	492	6.8
Bakeries,	6,506	680	10.4
Car and railroad shops,	6,171	617	9.9
Carpet mills,	5,813	325	5.5
Marble and stone cutters,	4,910	287	5.8
Makers of blank books, envelopes, tags, paper bags, etc.	4,563	253	5.5
Box makers (paper),	4,295	334	7.7
Pianos and organs,	4,221	441	10.4
Automobile factories,	4,165	1,194	28.6
Box makers (wood),	3,912	536	13.7
Slaughtering and packing houses,	3,864	726	18.7

TABLE VI. — Occurrence of Non-fatal Accidents by Hours of the Day and by Days of the Week, July 1, 1913, to June 30, 1914.

INDUSTRIES.	HOURS, A.M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Agriculture,	5	8	8	11	8
Forestry,	3	5	8	11	5
Animal husbandry,	3	1	3	11	9
Ice harvesting,	1	.	1	1	3	4	7	22	20	2
Mining,	1	1	6
Quarrying,	1	.	7	.	.	1	20	48	54	66	51	46
Building and hand trades,	5	7	.	9	6	13	58	355	777	1,289	1,190	559
Fertilizer makers,	4	5	10	10	6
Paint makers,	3	4	5	11	22	5
Powder, cartridge, fireworks, etc., makers,	1	1	2	9	2	1
Soap makers,	10	37	55	92	79	10
Other chemical workers,	2	1	1	1	.	3	1	12	9	7	30
Brick makers,	1	2	4	2	4	5
Potteries,	1	2	1	1	3	3
Tile makers,	3	8	7	13	15	9
Glass makers, workers,	1	3	2	.	1	2
Terra-cotta workers,	1	3	2	12	9	4
Lime, cement and gypsum,	1	.	.	.	5	32	21	43	50	18
Marble and stone cutters,	1	.	.	.	1	10	19	40	48	22
Clothing makers,	1	.	.	.	3	7	10	17	14	8
Corset makers,
Glove makers,	1	3	6	7	6	4
Hat makers (wool or felt),	2	4	9	11	6	4
Shirt, collar and cuff makers,	5	6	11	11	20	52	54	65	70	52
Batteries,	5	4	.	.	.	.	.	.	.	.	.	1
Butter and cheese makers,	2	.	.	.	1	2	5	39	50	57	85	45
Candy,	3	3	1	1	12	1
Fish curers and packers,	2	5	6	4
Flour and grain mills,	4	.	1	5	.	1	1	3	2	2	1
Fruit and vegetable canners, picklers, preservers,	2	2	2	4	16	55	58	97	91	43
Slaughter and packing houses,	1	1	2	2	2	1	5	8	20	21	26	14
Sugar makers and refiners,	1	.	.	.	.	3	3	12	21	40	45	22
Other food preparers,	1	.	2	1	1	16	10	22	26	9
Agricultural implements,	4	16	127	179	155	64
Automobile factories,	2	2	4	.	1	1	19	74	127	179	155	64

TABLE VI. — Occurrence of Non-fatal Accidents, etc. — Continued.

INDUSTRIES.	HOURS, A.M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Car and railroad shops,	1	1	1	1	2	2	4	35	70	71	90	62
Foundries and metal working,	6	5	5	10	4	18	164	757	997	1,301	1,210	555
Iron and steel mills,	-	1	4	1	3	3	8	37	44	62	61	18
Ship and boat building,	-	1	-	-	-	1	3	57	73	79	72	54
Wagons and carriages,	-	-	-	-	-	-	1	13	17	15	19	9
Other iron and steel workers,	10	14	23	16	17	20	93	299	397	575	506	248
Harness and saddle makers and repairers,	-	-	-	-	-	-	2	3	3	10	9	1
Leather belt, leather case and pocketbook makers,	-	1	-	-	2	2	6	12	18	29	14	10
Shoes,	2	2	1	5	3	5	77	356	538	763	634	310
Tanners,	2	2	1	2	2	7	47	107	118	167	187	87
Trunk makers,	-	-	-	-	-	-	-	1	5	3	3	3
Breweries,	1	3	1	2	3	2	12	22	40	60	77	46
Distilleries,	-	1	-	-	-	-	-	1	15	2	3	2
Other liquor and beverage workers,	-	1	-	-	-	-	3	6	15	21	22	12
Box makers (wood),	1	1	-	3	-	2	13	37	57	87	68	34
Furniture,	1	1	-	-	-	3	10	67	92	148	135	52
Pianos and organs,	-	1	1	-	-	-	4	37	38	72	64	27
Saw and planing mills,	-	1	-	-	2	1	4	20	18	41	24	15
Other woodworkers,	-	2	-	1	-	-	25	80	131	167	166	79
Brass mills,	2	-	-	1	-	-	3	10	16	25	30	14
Clock factories,	-	-	-	1	-	-	-	4	-	2	2	1
Copper factories,	-	1	4	1	-	-	4	1	10	5	11	1
Gold and silver workers,	-	-	-	-	-	-	2	5	16	22	21	10
Jewelry factories,	-	-	1	-	-	1	5	24	40	57	61	24
Lead and zinc factories,	-	-	-	-	-	-	-	-	3	4	4	1
Tin-plate factories,	-	-	-	-	1	-	6	12	9	16	15	7
Watch factories,	-	-	-	-	-	1	3	10	12	8	10	8
Brass and copper,	-	-	-	-	-	-	3	7	14	24	19	14
Other metal workers,	1	-	-	1	-	1	8	24	44	91	70	30
Box makers (paper),	-	-	-	-	-	2	6	24	31	46	46	25
Makers of blank books, envelopes, tags, paper bags, etc.,	-	-	-	-	-	-	3	17	30	44	36	17
Paper mills,	5	16	19	17	13	15	52	95	118	201	171	87
Pulp mills,	-	-	-	1	-	-	-	-	9	5	4	4
Other papers,	1	2	-	3	2	-	6	16	20	41	34	17
Printing and publishing establishments,	3	7	10	6	6	7	10	39	63	111	121	83
Carpet mills,	-	-	-	-	1	1	10	25	33	63	41	25
Cotton mills,	7	11	9	20	12	16	319	648	833	1,168	971	504

Dyeing and finishing textiles,	2	3	1	2	2	3	33	53	65	79	91	46
Hemp and jute mills,	2	1	1	1	1	1	4	29	42	74	53	20
Knitting mills,	1	1	1	1	1	1	13	34	61	66	31	1
Lace and embroidery makers,	1	1	1	1	1	1	2	2	1	2	1	1
Linen mills,	1	1	1	1	1	1	9	7	15	15	23	8
Print works,	1	1	1	1	1	1	26	40	49	61	62	35
Rope and cordage factories,	1	1	1	1	1	1	2	6	9	14	7	10
Sail, awning and tent makers,	1	1	1	1	1	1	2	2	2	2	7	2
Silk mills,	11	6	12	17	4	18	147	232	373	466	431	12
Woolen and worsted mills,	1	1	1	1	1	1	16	51	51	83	75	239
Not specified textile workers,	1	1	1	1	1	1	11	11	20	22	26	44
Broom and brush makers,	1	1	1	1	1	1	1	11	14	22	18	9
Button makers,	1	1	1	1	1	1	1	1	1	1	6	3
Charcoal and coke burners,	1	1	1	1	1	1	3	2	1	7	6	3
Cigars,	4	7	7	4	4	4	10	41	37	134	123	51
Electric light and power companies,	7	8	13	12	12	12	75	310	74	502	450	216
Electrical supplies,	9	13	12	13	13	7	30	67	100	136	135	57
Gas works,	9	13	12	13	13	7	30	67	100	136	135	57
Oil works,	11	23	29	25	28	32	52	122	192	220	210	136
Rubber factories,	2	6	1	2	1	3	3	4	6	9	12	5
Straw workers,	2	6	1	2	1	3	3	16	26	52	35	20
Gas and electric companies,	2	6	1	2	1	3	32	73	129	151	153	58
Other miscellaneous industries and occupations,	2	6	1	2	1	3	17	52	81	136	137	65
Workers in "not specified" manufacturing and mechanical industries,	4	6	7	5	7	14	23	79	128	156	120	99
Water transportation,	7	16	16	19	9	16	32	162	236	346	340	167
Construction and maintenance of streets, roads, sewers, bridges, etc.,	2	1	3	4	2	1	7	12	12	13	14	7
Livery stables,	1	7	3	3	1	15	40	96	145	171	195	124
Truck transfer, cab and hack companies,	23	29	21	19	25	37	97	161	179	226	249	164
Street railways,	32	42	35	40	46	57	121	330	432	470	472	314
Steam railroads,	5	4	2	2	2	11	32	37	59	75	79	71
Express companies,	1	1	1	1	1	1	3	11	17	47	43	22
Telegraph and telephone,	1	1	1	1	1	1	1	1	2	1	3	1
Other persons in transportation,	1	1	1	1	1	1	1	1	1	1	3	4
Banking and brokerage,	1	1	1	1	1	1	1	1	1	1	3	2
Insurance,	1	1	1	1	1	1	1	1	1	1	3	4
Real estate,	14	13	20	33	40	47	175	437	732	1,079	1,088	693
Wholesale and retail trade,	1	1	1	1	1	1	1	1	1	1	1	1
Elevators,	1	1	1	1	1	1	1	1	1	1	1	1
Warehouses and cold-storage plants,	1	1	1	1	1	1	1	1	1	1	1	1
Other persons in trade,	1	1	1	1	1	1	1	1	1	1	1	1
Clerical assistants (industry, business or profession not specified),	3	3	3	3	3	3	17	20	36	53	58	35
Professional service (all kinds),	2	7	6	7	5	10	54	69	97	138	150	115
Occupations not in industries,	2	7	6	7	5	10	54	69	97	138	150	115
Laundries and laundry work,	1	1	1	1	1	1	2	17	18	28	31	18
Total,	205	287	303	320	345	492	2,220	6,376	9,203	12,940	12,204	6,459

TABLE VI. — Occurrence of Non-fatal Accidents, etc. — Continued.

INDUSTRIES.	HOURS, P.M.												DAYS OF THE WEEK.						Total.	
	1	2	3	4	5	6	7	8	9	10	11	12	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.		Sunday.
Agriculture,	2	10	13	9	8	1	1	—	—	2	1	—	14	17	20	15	18	21	2	107
Forestry,	7	5	11	14	7	1	1	—	—	—	—	—	16	14	15	14	20	8	—	87
Animal husbandry,	—	—	5	2	2	1	1	1	—	—	—	—	4	4	1	3	4	3	2	21
Ice harvesting,	6	9	15	23	13	1	1	1	—	—	—	—	22	32	16	22	16	18	7	133
Mining,	—	—	—	—	—	—	—	—	—	—	—	—	2	—	3	—	—	—	—	6
Quarrying,	14	38	40	43	19	1	—	—	—	1	—	1	65	64	81	73	76	80	5	444
Building and hand trades,	267	771	971	785	418	60	24	14	26	12	12	3	1,329	1,404	1,290	1,254	1,283	992	86	7,638
Fertilizer makers,	3	9	15	15	4	—	—	1	1	4	2	—	13	20	19	10	9	16	3	90
Paint makers,	—	7	9	6	7	—	—	—	—	—	—	—	15	13	13	12	18	9	—	80
Powder, cartridge, fireworks, etc.,	3	2	3	—	1	—	1	—	—	—	—	—	3	4	5	9	3	1	—	25
Soap makers,	—	4	10	9	3	1	1	—	—	—	—	—	12	10	9	10	8	5	1	55
Other chemical workers,	22	77	66	74	38	4	2	3	—	4	6	—	81	122	102	106	92	94	7	604
Brick makers,	—	1	9	4	2	—	1	1	—	—	1	—	11	11	8	15	11	7	1	64
Potters,	3	4	5	4	6	—	2	—	—	—	—	—	6	12	7	6	7	2	—	40
Tile makers,	—	—	1	2	1	1	—	—	—	—	—	—	2	6	1	3	2	1	—	15
Glass makers, workers,	5	6	13	15	8	2	2	1	—	—	—	—	21	22	20	11	22	11	—	107
Terra-cotta workers,	—	—	—	—	—	—	—	—	—	—	—	—	2	3	2	2	1	3	5	16
Lime, cement and gypsum,	6	4	6	8	8	2	1	—	—	—	—	—	9	11	13	12	9	8	4	66
Marble and stone cutters,	12	29	41	27	5	2	2	1	—	—	—	—	45	51	46	50	43	52	23	287
Clothing makers,	9	23	27	29	31	10	—	—	—	—	—	—	53	56	54	39	45	23	1	271
Corset makers,	4	7	8	6	9	—	—	—	—	—	—	—	15	14	18	9	20	18	—	94
Glove makers,	—	—	2	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	2
Hat makers (wool or felt),	—	2	2	2	5	2	—	—	1	—	—	—	7	9	9	6	6	4	—	41
Shirt, collar and cuff makers,	4	3	5	11	8	2	—	—	—	—	—	—	11	9	12	16	14	7	—	60
Bakeries,	27	58	53	62	56	25	5	6	11	7	12	3	115	105	134	113	118	75	20	680
Butter and cheese makers,	—	—	—	—	—	1	1	—	—	—	—	—	1	—	—	1	—	—	—	2
Candy,	19	42	53	39	40	9	1	2	—	—	—	—	83	86	86	87	97	52	1	492
Fish curers and packers,	—	—	—	—	6	6	—	—	—	—	—	—	7	11	8	6	12	8	1	53
Flour and grain mills,	1	2	4	2	1	—	—	—	1	—	—	—	7	5	7	3	7	2	—	31

Fruit and vegetable canners, picklers, preservers, . . .	1	73	69	2	1	2	1	60	2	1	22	1	7	5	6	4	3	—	3	133	132	6	2	115	4	2	107	117	1	—	4	18
Slaughter and packing houses, . . .	20	19	37	14	9	1	1	9	1	1	7	4	4	7	3	1	3	—	—	36	30	35	107	35	40	30	32	7	4	726		
Sugar makers and refiners, . . .	8	16	22	22	17	4	4	1	1	2	7	4	1	1	3	2	3	—	—	41	44	44	33	44	44	33	35	12	210			
Other food preparers, . . .	11	13	21	22	17	4	4	1	1	2	4	1	1	1	1	1	1	—	—	20	41	34	28	15	28	15	35	7	253			
Agricultural implementers, . . .	52	110	130	115	106	41	4	4	2	2	4	2	2	2	2	2	1	1	1	244	215	198	203	123	203	123	123	4	1,194			
Automobile factories, . . .	19	69	66	60	54	1	3	3	2	2	3	3	3	2	2	1	1	1	1	112	105	99	113	101	101	85	2	617				
Car and railroad shops, . . .	257	848	1,175	1,280	955	255	20	42	42	26	18	11	15	15	15	15	15	15	15	1,776	1,727	1,738	1,736	1,736	1,736	1,736	1,736	33	9,934			
Foundries and metal working, . . .	14	38	46	44	27	17	3	3	1	1	3	3	3	1	1	1	1	1	1	57	92	63	87	76	51	9	435					
Iron and steel mills, . . .	22	62	74	74	11	5	1	2	1	2	1	1	1	1	1	1	1	1	1	102	114	104	95	87	84	7	7	593				
Ship and boat building, . . .	2	12	11	13	13	1	2	1	1	1	2	1	1	1	1	1	1	1	1	28	23	20	16	28	18	1	1	134				
Wagons and carriages, . . .	107	362	413	416	300	149	19	21	32	22	21	7	7	710	745	728	692	700	494	15	10	10	15	4	4	1	1	59				
Other iron and steel workers, . . .	2	5	9	6	7	2	—	—	—	—	—	—	—	—	—	—	—	—	—	11	8	10	15	4	4	1	1	59				
Harness and saddle makers and repairers, . . .	2	5	9	6	7	2	—	—	—	—	—	—	—	—	—	—	—	—	—	11	8	10	15	4	4	1	1	59				
Leather belt, leather case and pocket-book makers, . . .	8	18	21	12	11	7	2	2	2	2	1	1	1	1	1	1	1	1	1	23	32	31	35	34	34	34	23	1	179			
Shoes, . . .	191	459	556	490	305	89	4	5	7	6	3	2	2	2	2	2	2	2	2	845	839	832	829	879	879	879	585	4	4,813			
Tanneries, . . .	55	115	136	118	102	30	1	1	1	6	5	2	2	239	239	222	206	221	161	239	239	222	206	221	221	161	9	1,297				
Trunk makers, . . .	1	1	2	5	3	1	—	—	—	—	—	—	—	—	—	—	—	—	—	2	7	7	6	4	4	2	2	28				
Breweries, . . .	24	44	60	53	49	7	3	2	7	—	—	—	—	92	83	95	77	71	90	92	83	95	77	71	71	90	13	521				
Distilleries, . . .	—	—	1	—	3	1	—	—	—	—	—	—	—	—	—	—	—	—	—	4	6	4	1	2	2	2	2	17				
Other liquor and beverage workers, . . .	6	17	28	18	21	5	4	1	2	2	1	1	1	31	28	25	29	41	26	31	28	25	29	41	26	2	2	182				
Box makers (wood), . . .	8	39	53	63	45	20	3	—	2	2	—	—	—	93	95	100	98	93	54	93	95	100	98	93	54	3	3	536				
Furniture, . . .	30	71	98	98	80	27	5	—	—	—	—	—	—	155	190	155	147	154	118	155	190	155	147	154	118	3	3	922				
Pianos and organs, . . .	8	36	62	54	32	5	—	1	—	—	—	—	—	80	63	86	81	74	54	80	63	86	81	74	54	3	3	441				
Saw and planing mills, . . .	7	15	23	25	11	3	—	2	—	—	—	—	—	42	33	33	40	36	29	26	33	33	40	36	29	2	2	215				
Other woodworkers, . . .	28	99	138	112	84	13	1	5	—	—	—	—	—	206	222	180	185	182	153	42	206	222	180	185	182	153	4	4	1,132			
Brass mills, . . .	18	20	18	24	20	4	—	1	1	1	1	1	1	38	39	35	35	42	11	38	39	35	35	42	11	1	1	206				
Clock factories, . . .	2	1	1	2	1	—	—	—	—	—	—	—	—	2	3	3	3	1	5	2	3	3	3	3	1	1	1	15				
Copper factories, . . .	2	4	10	8	10	4	1	—	2	2	1	1	1	14	9	18	15	12	7	14	9	18	15	12	7	10	10	75				
Gold and silver workers, . . .	4	6	18	8	8	3	—	—	—	—	—	—	—	22	27	24	20	23	10	22	27	24	20	23	10	10	10	126				
Jewelry factories, . . .	14	29	52	37	38	21	—	2	3	3	2	2	2	66	80	68	74	73	49	66	80	68	74	73	49	1	1	411				
Lead and zinc factories, . . .	—	4	2	2	2	—	—	—	—	—	—	—	—	5	3	5	3	4	—	5	3	5	3	4	4	—	—	20				
Tin-plate factories, . . .	7	8	22	13	8	3	—	1	—	—	—	—	—	19	28	19	25	26	11	19	28	19	25	26	11	1	1	128				
Watch factories, . . .	6	4	4	11	10	1	—	—	1	—	—	—	—	14	22	16	13	16	7	14	22	16	13	16	7	1	1	89				
Brass and copper, . . .	2	11	20	12	6	10	1	1	—	—	—	—	—	18	25	23	33	31	14	18	25	23	33	31	14	1	1	144				
Other metal workers, . . .	17	53	50	66	44	9	2	—	—	—	—	—	—	92	90	81	92	86	71	92	90	81	92	86	71	1	1	513				
Box makers (paper), . . .	8	21	49	33	34	7	1	—	—	—	—	—	—	67	55	57	59	57	38	67	55	57	59	57	38	1	1	334				
Makers of blank books, envelopes, tags, paper bags, etc., . . .	4	24	23	24	19	11	—	1	—	—	—	—	—	39	44	47	44	50	27	39	44	47	44	50	27	2	2	253				
Paper mills, . . .	35	100	163	142	113	43	18	18	24	25	18	5	—	243	261	282	264	261	164	243	261	282	264	261	164	38	38	1,513				
Pulp mills, . . .	1	2	4	3	1	1	1	1	1	1	1	1	1	5	3	7	7	8	6	5	3	7	7	8	6	4	4	36				
Other papers, . . .	10	20	27	34	26	6	1	2	1	1	2	—	—	46	52	62	46	34	28	46	52	62	46	34	28	4	4	272				

TABLE VI. — Occurrence of Non-fatal Accidents, etc. — Concluded.

INDUSTRIES.	HOURS, P.M.												DAYS OF THE WEEK.						Total.	
													Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.		Sunday.
	1	2	3	4	5	6	7	8	9	10	11	12								
Printing and publishing establishments,	39	62	106	90	68	26	3	15	8	13	7	5	150	155	166	155	161	96	25	908
Carpet mills,	11	30	32	38	28	4	—	2	1	—	2	—	70	54	57	51	58	33	2	325
Cotton mills,	261	532	738	776	632	150	38	41	29	13	11	14	1,310	1,378	1,374	1,313	1,524	821	53	7,773
Dyeing and finishing textiles,	28	52	62	63	46	15	7	7	6	4	3	—	124	120	119	123	109	69	9	673
Hemp and jute mills,	10	26	64	59	25	13	—	1	1	—	—	—	70	64	84	70	95	40	—	423
Knitting mills,	22	35	41	48	38	9	—	—	2	—	—	—	84	69	87	91	84	53	1	469
Lace and embroidery makers,	—	1	—	—	—	—	—	—	—	—	—	—	—	2	2	1	1	—	—	6
Linen mills,	5	12	7	16	12	2	1	1	—	1	1	—	29	26	15	25	24	17	2	138
Print works,	20	40	54	40	40	13	3	1	—	1	1	—	79	79	94	74	90	71	6	493
Rope and cordage factories,	—	2	4	10	—	5	4	1	—	—	—	—	18	6	20	15	12	12	—	83
Sail, awning and tent makers,	—	3	1	—	—	—	—	—	—	—	—	—	3	3	4	4	4	5	—	19
Silk mills,	3	9	8	12	11	1	—	1	—	—	—	—	23	17	26	15	28	16	—	125
Woolen and worsted mills,	118	199	342	304	267	79	15	28	12	22	18	12	535	569	620	579	672	391	26	3,392
Not specified textile workers,	21	48	72	56	43	16	—	5	4	—	—	—	90	108	110	115	97	65	4	589
Broom and brush makers,	12	12	25	16	6	—	—	—	—	—	—	1	28	18	33	32	23	23	—	157
Button makers,	3	7	13	7	6	6	—	—	—	—	—	—	19	19	26	19	18	16	—	117
Charcoal and coke burners,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1
Cigars,	3	5	3	4	5	—	—	—	1	—	—	—	11	5	10	6	8	3	—	43
Electric light and power companies,	34	73	93	112	62	26	14	23	21	21	16	6	148	160	152	127	164	156	59	966
Electrical supplies,	97	309	376	394	302	156	23	32	27	19	17	10	611	702	711	651	658	402	19	3,754
Gas works,	35	102	159	89	68	27	18	24	15	22	18	4	158	191	186	187	187	187	76	1,172
Oil works,	4	3	1	—	2	2	—	1	—	—	—	—	7	5	8	2	5	2	—	29
Rubber factories,	74	146	196	214	162	81	24	46	33	32	28	11	384	401	355	355	380	236	16	2,127
Straw workers,	2	5	5	7	3	—	—	1	—	—	—	—	12	13	5	14	11	6	1	62
Gas and electric companies,	9	16	29	29	15	15	1	5	3	5	2	—	58	44	46	49	45	35	15	292
Other miscellaneous industries and occupations,	36	92	125	101	102	48	5	4	4	3	1	1	209	198	205	195	196	128	4	1,135
Workers in "not specified" manufacturing and mechanical industries,	26	90	104	91	72	21	2	3	6	1	2	—	164	158	170	142	159	118	5	916
Water transportation,	35	137	140	138	109	58	33	26	30	39	12	6	256	195	216	217	267	208	52	1,411

Construction and maintenance of streets, roads, sewers, bridges, etc.,	84	204	335	272	173	57	11	27	33	26	22	9	436	430	417	405	448	384	99	2,619
Livery stables,	8	3	8	12	6	11	6	5	3	6	1	1	19	22	18	22	24	23	17	145
Truck, transfer, cab and hack com- panies,	55	98	165	176	130	73	24	17	6	8	6	8	285	288	246	238	239	246	25	1,567
Street railways,	126	215	244	223	187	123	100	95	75	79	46	35	425	398	422	473	433	423	204	2,778
Steam railroads,	182	395	486	373	312	139	69	87	74	84	85	32	759	765	773	744	806	639	223	4,709
Express companies,	36	43	66	50	50	64	46	29	29	15	5	6	117	150	145	154	124	114	17	821
Telegraph and telephone,	7	22	20	31	14	1	5	1	2	2	—	—	47	41	47	33	46	29	5	248
Other persons in transportation,	—	1	3	3	—	2	1	1	3	1	1	—	2	8	1	6	3	4	2	26
Banking and brokerage,	—	2	3	3	3	1	—	—	—	—	—	—	7	8	8	5	1	10	1	38
Insurance,	5	2	6	5	3	3	3	1	3	—	—	—	16	11	10	7	12	9	1	66
Real estate,	14	20	35	21	11	9	4	8	2	1	3	—	41	47	41	42	49	41	10	271
Wholesale and retail trade,	382	626	932	879	661	328	99	93	65	51	28	9	1,455	1,444	1,443	1,344	1,325	1,401	112	8,524
Elevators,	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	3
Warehouses and cold-storage plants,	8	32	26	32	24	8	1	1	2	5	—	—	48	38	51	45	50	34	2	268
Other persons in trade,	2	3	9	4	4	3	2	2	—	1	—	—	10	13	11	19	7	11	4	75
Clerical assistants (industry, business or profession not specified),	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1
Professional service (all kinds),	16	41	49	48	33	11	10	7	6	6	4	—	91	66	84	77	67	61	26	472
Occupations not in industries,	76	103	105	106	82	64	54	67	42	45	23	10	247	199	233	203	232	231	112	1,457
Laundries and laundry work,	11	19	26	19	14	7	2	—	1	1	1	—	45	32	38	38	34	26	3	216
Total,	3,357	7,852	10,440	9,776	7,224	2,638	786	867	727	655	476	230	16,463	16,691	16,601	16,044	16,653	12,360	1,570	96,382

TABLE VII. — Occurrence of Fatal Accidents by Hours of the Day and by Days of the Week, July 1, 1913, to June 30, 1914.

INDUSTRIES.	HOURS, A.M.											
	1	2	3	4	5	6	7	8	9	10	11	12
Agriculture,								1		1		
Forestry,												
Animal husbandry,												
Ice harvesting,			1									
Quarrying,											1	1
Building and hand trades,								7	6	9	13	10
Fertilizer makers,												
Paint makers,												
Powder, cartridge, fireworks, etc., makers,												
Soap makers,												
Other chemical workers,									1		1	1
Brick makers,												
Marble and stone cutters,								1				
Bakeries,												
Fish curers and packers,										1	1	1
Slaughter and packing houses,												
Other food preparers,							2	1	1	1	1	1
Foundries and metal working,												
Iron and steel mills,									1	1	1	1
Ship and boat building,									1			
Wagons and carriages,												
Other iron and steel workers,							1	1	1		1	
Leather belt, leather case and pocketbook makers,											2	
Shoes,				1	1		1		1	1		2
Tanneries,												
Trunk makers,												
Breweries,								1		1	1	
Other liquor and beverage workers,												
Box makers (wood),												
Furniture,												
Pianos and organs,										1	1	1
Other woodworkers,												
Copper factories,												
Other metal workers,												
Paper mills,	2					1	1		1			

TABLE VII. — Occurrence of Fatal Accidents, etc. — Concluded.

INDUSTRIES.	HOURS, P.M.												DAYS OF THE WEEK.							Total.
													Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	
	1	2	3	4	5	6	7	8	9	10	11	12								
Agriculture,	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	3
Forestry,	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Animal husbandry,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ice harvesting,	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Quarrying,	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	3
Building and hand trades,	3	6	10	8	1	-	-	-	-	1	1	-	21	10	12	7	15	8	1	74
Fertilizer makers,	-	-	-	1	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Paint makers,	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Powder, cartridge, fireworks, etc., makers,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Soap makers,	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
Other chemical workers,	-	-	1	-	-	-	-	-	-	-	-	-	4	-	1	-	-	-	-	5
Brick makers,	1	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	5
Marble and stone cutters,	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1	1	-	-	-	2
Bakeries,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Fish curers and packers,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Slaughter and packing houses,	1	1	1	2	-	-	-	-	-	-	-	-	1	-	2	1	1	1	-	6
Other food preparers,	-	-	-	-	-	1	-	-	-	-	-	-	1	-	2	1	1	1	-	6
Foundries and metal working,	-	2	1	-	1	1	-	-	-	-	-	-	3	1	3	3	1	1	1	12
Iron and steel mills,	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	-	2
Ship and boat building,	-	-	-	2	1	-	-	-	-	-	-	-	2	2	1	-	-	1	-	6
Wagons and carriages,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Other iron and steel workers,	1	1	1	-	-	1	1	-	-	-	-	-	1	1	2	1	1	1	1	8
Leather belt, leather case and pocket-book makers,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2
Shoes,	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	1	1	-	-	4
Tanneries,	1	1	-	-	1	1	-	-	-	-	-	-	-	1	2	3	3	1	-	9
Trunk makers,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Breweries,	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	1	4
Other liquor and beverage workers,	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	1
Box makers (wood),	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1

[illegible]

TABLE VIII. — *Occurrence of Non-fatal Accidents by Months of the Year, July 1, 1913, to June 30, 1914.*

MONTHS.												Number of Accidents.
July,	.	.	.	.	.	.	.	.	.	.	.	8,473
August,	.	.	.	.	.	.	.	.	.	.	.	7,147
September,	.	.	.	.	.	.	.	.	.	.	.	7,680
October,	.	.	.	.	.	.	.	.	.	.	.	7,461
November,	.	.	.	.	.	.	.	.	.	.	.	8,189
December,	.	.	.	.	.	.	.	.	.	.	.	8,373
January,	.	.	.	.	.	.	.	.	.	.	.	8,363
February,	.	.	.	.	.	.	.	.	.	.	.	8,076
March,	.	.	.	.	.	.	.	.	.	.	.	8,071
April,	.	.	.	.	.	.	.	.	.	.	.	8,558
May,	.	.	.	.	.	.	.	.	.	.	.	7,864
June,	.	.	.	.	.	.	.	.	.	.	.	8,127
Total,	.	.	.	.	.	.	.	.	.	.	.	96,382

TABLE IX. — *Occurrence of Fatal Accidents by Months and Days of the Month, July 1, 1913, to June 30, 1914.*

DAYS OF THE MONTH.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
1,	1	2	—	1	—	—	2	—	—	1	1	7	15
2,	1	2	1	2	—	2	1	1	1	1	2	1	15
3,	2	—	—	—	5	4	—	1	—	—	—	2	16
4,	3	4	2	1	2	1	1	2	4	1	2	1	24
5,	1	—	—	—	—	—	3	—	—	—	—	1	6
6,	1	1	1	1	1	2	—	2	1	3	1	—	14
7,	1	—	—	1	1	—	3	1	—	—	—	1	9
8,	—	5	3	1	5	2	—	—	1	3	—	2	23
9,	2	1	2	1	—	1	1	—	—	—	2	1	11
10,	2	—	3	1	2	4	—	2	1	4	1	3	23
11,	3	3	2	1	1	1	—	1	3	2	1	2	20
12,	1	2	—	—	1	3	2	1	1	—	3	1	15
13,	1	1	1	1	2	2	1	2	—	—	—	3	15
14,	5	2	—	1	5	—	2	4	1	7	3	—	30
15,	3	3	2	—	5	—	—	1	1	2	2	—	19
16,	—	1	2	1	1	1	—	2	2	3	3	—	16
17,	2	—	2	3	—	1	1	3	2	—	—	1	14
18,	1	3	—	—	—	1	1	—	—	2	2	2	13
19,	1	1	1	—	2	—	3	1	1	—	3	3	15
20,	2	1	—	2	1	2	—	—	2	1	3	3	17
21,	2	—	1	5	—	1	1	1	—	3	—	1	16
22,	3	4	—	3	—	5	1	—	—	2	—	1	20
23,	2	2	1	—	—	3	1	2	1	1	—	3	16
24,	2	—	4	—	3	1	2	7	3	1	1	3	26
25,	1	2	1	5	—	—	—	2	—	—	1	6	19
26,	—	1	—	1	4	2	2	6	1	—	3	1	21
27,	—	—	—	—	2	—	—	1	2	1	—	3	9
28,	—	2	2	2	2	—	1	1	2	1	1	1	15
29,	3	1	2	2	—	—	3	—	1	2	3	1	18
30,	—	1	3	3	1	—	—	—	2	—	—	—	10
31,	4	1	—	2	—	1	1	—	—	—	—	—	9
Total,	48	46	38	43	47	40	33	45	34	41	40	51	509

TABLE X. — *Distribution of Non-fatal Accidents by Sex, Age and Basis of Wage Payments, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	SEX.		AGE PERIODS.						BASIS OF WAGE PAYMENTS.		
	Male.	Female.	Under 16 Years.	16 to 20 Years.	21 to 29 Years.	30 to 39 Years.	40 to 49 Years.	50 to 59 Years.	60 Years and over.	Piece-workers.	Time-workers.
Agriculture,	106	1	-	11	33	25	19	11	8	1	106
Forestry,	87	-	-	8	36	23	14	4	2	13	74
Animal husbandry,	20	1	-	2	3	4	5	5	2	1	20
Ice harvesting,	133	-	-	9	36	37	31	15	5	2	131
Mining,	6	-	-	-	3	1	2	-	-	-	6
Quarrying,	444	-	2	39	124	134	83	49	13	23	421
Building and hand trades,	7,632	6	16	647	2,504	2,267	1,432	572	200	44	7,594
Fertilizer makers,	90	-	2	3	22	33	14	11	5	12	78
Paint makers,	80	-	1	9	24	29	9	5	3	-	80
Powder, cartridge, fireworks, etc., makers,	17	8	4	3	6	2	5	3	2	4	21
Soap makers,	51	4	3	9	16	9	12	8	1	2	53
Other chemical workers,	557	47	-	89	235	163	74	28	12	22	582
Brick makers,	64	-	1	2	16	23	11	7	4	8	56
Potteries,	40	-	1	9	15	9	3	2	1	1	39
Tile makers,	15	-	-	2	7	1	3	2	-	-	15
Glass makers, workers,	104	3	-	17	39	21	17	9	1	1	106
Terra-cotta workers,	16	-	-	-	6	3	3	4	-	-	16
Lime, cement and gypsum,	66	-	-	3	20	22	12	6	3	4	62
Marble and stone cutters,	286	1	2	33	72	84	57	28	11	7	280
Clothing makers,	141	130	10	102	100	35	20	3	1	87	184
Corset makers,	23	71	9	47	22	10	4	1	1	35	59
Glove makers,	2	-	-	1	-	1	-	-	-	-	2
Hat makers (wool or felt),	34	7	-	12	8	6	7	5	3	6	35
Shirt, collar and cuff makers,	13	51	1	27	24	11	4	4	2	42	27
Bakeries,	570	110	6	148	282	147	64	28	5	91	589
Butter and cheese makers,	2	-	-	-	2	-	-	-	-	-	2
Candy,	360	132	41	119	216	62	38	13	3	16	476
Fish curers and packers,	49	4	-	12	12	6	12	5	6	10	43
Flour and grain mills,	28	3	-	6	9	3	7	5	1	1	31
Fruit and vegetable canners, picklers, preservers,	12	6	-	8	1	7	1	-	-	-	17
Slaughter and packing houses,	719	7	1	47	348	166	102	40	22	28	698

TABLE X. — *Distribution of Non-fatal Accidents, etc. — Continued.*

INDUSTRIES.	SEX.		AGE PERIODS.						BASIS OF WAGE PAYMENTS.		
	Male.	Female.	Under 16 Years.	16 to 20 Years.	21 to 29 Years.	30 to 39 Years.	40 to 49 Years.	50 to 59 Years.	60 Years and over.	Piece-workers.	Time-workers.
Sugar makers and refiners,	206	4	2	14	84	60	31	12	7	—	210
Other food preparers,	219	34	4	36	87	67	34	22	3	11	242
Agricultural implementers,	182	—	1	19	69	43	28	14	8	37	145
Automobile factories,	1,188	6	7	194	502	262	100	55	14	369	825
Car and railroad shops,	616	1	1	52	280	173	78	26	7	234	383
Foundries and metal working,	9,786	148	84	1,272	3,969	2,419	1,364	605	221	1,322	8,612
Iron and steel mills,	428	7	3	73	168	115	56	18	2	57	378
Ship and boat building,	592	1	4	59	221	160	100	35	14	241	352
Wagons and carriages,	134	—	—	11	30	35	32	17	9	—	134
Other iron and steel workers,	3,944	143	38	559	1,723	1,007	470	224	66	1,364	2,723
Harness and saddle makers and repairers,	49	10	1	18	18	9	9	4	—	13	46
Leather belt, leather case and pocketbook makers,	163	16	2	34	69	44	18	11	69	52	127
Shoos,	3,892	920	171	1,392	1,680	824	435	208	103	1,909	2,904
Tanneries,	1,273	24	8	170	521	304	176	88	30	178	1,119
Trunk makers,	20	—	1	10	9	6	1	1	—	7	21
Breweries,	520	1	—	5	118	191	140	56	11	521	140
Distilleries,	17	—	—	1	4	5	2	3	2	1	16
Other liquor and beverage workers,	180	2	5	37	72	50	10	7	1	—	182
Box makers (wood),	530	6	7	76	183	101	94	49	26	22	514
Furniture,	887	35	13	156	302	229	124	57	41	107	815
Pianos and organs,	424	17	10	88	126	71	76	52	18	58	383
Saw and planing mills,	215	—	—	25	58	53	44	27	8	6	209
Other woodworkers,	1,125	7	17	180	341	224	187	129	54	62	1,070
Brass mills,	189	17	2	32	76	47	31	15	3	38	168
Clock factories,	14	1	—	3	2	3	2	4	1	—	15
Copper factories,	75	—	—	7	28	17	13	6	4	1	74
Gold and silver workers,	120	6	2	34	33	30	13	13	1	4	122
Jewelry factories,	353	58	16	106	161	84	22	16	6	36	375
Lead and zinc factories,	20	—	—	6	3	5	2	3	1	—	20
Tin-plate factories,	118	10	2	35	60	19	9	9	3	31	97
Watch factories,	55	34	1	23	30	17	11	4	3	20	69
Brass and copper,	144	—	1	5	43	48	26	16	6	8	136
Other metal workers,	495	18	12	113	192	117	52	17	10	65	448

Box makers (paper), etc.,	206	128	15	134	114	43	18	8	2	104	230
Makers of blank books, envelopes, tags, paper bags, etc.,	144	109	9	130	66	18	24	4	2	77	176
Paper mills,	1,348	165	13	267	576	331	189	92	45	138	1,375
Pulp mills,	36	—	—	4	12	14	6	—	—	—	36
Other papers,	230	42	7	81	86	43	32	12	11	17	255
Printing and publishing establishments, Carpet mills,	792	116	45	232	298	152	108	47	25	103	583
Cotton mills,	231	94	25	84	213	59	45	61	8	103	292
Dyeing and finishing textiles, Hemp and jute mills,	5,856	1,917	334	1,503	2,718	1,498	999	529	192	1,908	5,805
Knitting mills,	621	152	9	112	252	135	81	61	23	—	645
Lace and embroidery makers, Linen mills,	264	159	12	116	165	77	37	10	6	133	290
Print works,	283	176	3	147	146	70	47	31	10	165	304
Rope and cordage factories, Sail, awning and tent makers, Silk mills,	98	40	12	34	1	2	—	—	—	—	6
Woolen and worsted mills,	392	101	28	73	156	110	82	14	3	32	106
Not specified textile workers, Broom and brush makers,	65	18	4	18	25	13	15	31	13	81	412
Button makers,	19	—	—	3	4	8	2	4	—	11	72
Charcoal and coke burners,	89	36	10	33	34	26	10	5	7	—	19
Cigars,	2,676	716	117	612	1,123	697	466	261	116	32	93
Electric light and power companies, Electrical supplies,	438	151	35	141	208	112	60	24	9	440	2,932
Gas works,	104	53	7	61	55	21	9	3	1	112	477
Oil works,	96	21	3	28	68	12	2	2	1	55	102
Rubber factories,	1	8	1	15	—	—	—	—	—	75	42
Straw workers,	35	—	—	8	6	—	—	—	—	10	33
Gas and electric companies, Other miscellaneous industries and occupations, Workers in "not specified" manufacturing and me- chanical industries,	961	5	1	93	407	299	127	31	9	915	51
Water transportation,	3,535	219	26	568	1,784	810	368	156	42	2,379	1,175
Construction of streets, roads, sewers, bridges, etc.,	1,168	4	5	57	426	353	215	82	34	3	1,169
Livery stables,	29	—	—	3	11	4	5	4	2	—	29
Truck, transfer, cab and hack companies, Street railways,	1,887	240	32	272	999	481	226	89	28	634	1,493
Steam railroads,	57	5	—	10	10	16	14	8	4	10	52
Express companies,	292	130	—	19	88	94	64	20	7	1	291
Telegraph and telephone,	1,005	130	40	278	415	220	105	47	30	260	875
	803	113	38	218	318	165	103	54	20	137	779
	1,411	—	7	98	494	397	276	103	36	10	1,401
	2,617	2	5	184	849	805	495	207	74	2	2,617
	145	—	—	6	27	47	35	18	12	1	144
	1,566	1	4	105	469	493	315	144	37	2	1,565
	2,762	16	—	118	1,163	788	457	186	66	21	2,757
	4,671	38	5	292	2,001	1,304	703	294	110	609	4,100
	820	1	3	54	390	224	111	32	7	2	819
	235	13	3	35	112	58	27	10	3	—	248

TABLE X. — *Distribution of Non-fatal Accidents, etc. — Concluded.*

INDUSTRIES.	SEX.		AGE PERIODS.							BASIS OF WAGE PAYMENTS.	
	Male.	Female.	Under 16 Years.	16 to 20 Years.	21 to 29 Years.	30 to 39 Years.	40 to 49 Years.	50 to 59 Years.	60 Years and over.	Piece-workers.	Time-workers.
Other persons in transportation,	26	8	1	7	9	2	5	2	—	—	26
Banking and brokerage,	30	18	1	6	13	6	8	2	2	1	38
Insurance,	48	16	—	13	16	12	15	8	2	—	65
Real estate,	228	43	—	13	58	73	79	31	17	—	271
Wholesale and retail trade,	7,416	1,108	113	1,349	2,555	2,176	1,259	593	179	82	8,442
Elevators,	3	—	—	1	1	—	—	1	—	—	3
Warehouses and cold-storage plants,	267	1	—	14	78	84	67	18	7	—	268
Other persons in trade,	68	7	2	17	29	13	9	4	1	1	74
Clerical assistants (industry, business or profession not specified),	1	—	—	—	—	1	—	—	—	—	1
Professional service (all kinds),	332	140	1	76	193	94	65	31	12	1	471
Occupations not in industries,	1,103	354	8	172	645	345	183	72	32	11	1,446
Laundries and laundry work,	140	76	7	34	80	44	36	13	2	12	204
Total,	87,609	8,773	1,525	14,210	35,678	23,054	13,546	6,114	2,255	15,551	80,828

TABLE XI. — *Distribution of Fatal Accidents by Sex, Age and Basis of Wage Payments, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	SEX.		AGE PERIODS.						BASIS OF WAGE PAYMENTS.		
	Male.	Female.	Under 16 Years.	16 to 20 Years.	21 to 29 Years.	30 to 39 Years.	40 to 49 Years.	50 to 59 Years.	60 Years and over.	Piece-workers.	Time-workers.
Agriculture,	3	-	-	-	1	1	-	1	-	-	3
Forestry,	1	-	-	-	1	1	-	-	-	-	1
Animal husbandry,	1	-	-	-	-	-	-	-	1	-	1
Ice harvesting,	1	-	-	1	-	-	-	-	-	-	1
Quarrying,	3	-	-	-	-	-	-	-	-	-	3
Building and hand trades,	74	-	4	4	14	19	18	12	7	1	73
Fertilizer makers,	1	-	-	-	-	1	-	-	-	-	1
Paint makers,	1	-	-	-	1	-	-	-	-	-	1
Powder, cartridge, fireworks, etc., makers,	2	-	-	-	1	-	-	1	-	-	2
Soap makers,	1	-	-	-	-	-	-	-	-	-	1
Other chemical workers,	5	-	1	-	1	1	1	1	-	-	5
Brick makers,	1	-	-	-	-	-	-	-	-	-	1
Marble and stone cutters,	2	-	-	-	-	-	1	2	-	-	2
Bakeries,	1	-	-	-	-	1	-	-	-	-	1
Fish curers and packers,	1	-	-	-	-	-	-	-	-	-	1
Slaughter and packing houses,	6	-	1	1	2	-	2	1	1	-	6
Other food preparers,	1	-	-	-	-	-	-	-	-	-	1
Foundries and metal working,	12	-	-	-	3	1	3	3	2	1	12
Iron and steel mills,	2	-	-	-	2	2	1	1	1	-	2
Ship and boat building,	6	-	-	-	-	-	1	1	1	-	6
Wagons and carriages,	1	-	-	-	-	2	1	3	-	2	1
Other iron and steel workers,	8	-	-	1	2	2	1	1	-	-	8
Leather belt, leather case and pocketbook makers,	2	-	-	2	-	1	1	2	-	-	2
Shoes,	3	1	-	1	1	1	3	2	-	-	4
Tanneries,	9	-	-	1	1	2	-	-	-	-	9
Trunk makers,	1	-	-	1	-	-	-	-	-	-	1
Breweries,	4	-	-	-	-	-	3	1	-	-	4
Other liquor and beverage workers,	1	-	-	-	1	-	-	-	-	-	1
Box makers (wood),	1	-	-	-	-	-	-	-	1	-	1
Furniture,	2	-	-	-	-	-	1	1	-	-	2
Pianos and organs,	2	-	1	-	-	-	-	-	-	-	2
Other woodworkers,	4	-	1	1	1	-	-	1	1	-	4
Copper factories,	1	-	-	-	-	-	-	-	-	-	1
Other metal workers,	1	-	-	-	-	-	1	-	-	-	1
Paper mills,	10	-	-	-	3	1	3	2	1	-	10

TABLE XI. — *Distribution of Fatal Accidents, etc. — Concluded.*

INDUSTRIES.	SEX.		AGE PERIODS.						BASIS OF WAGE PAYMENTS.		
	Male.	Female.	Under 16 Years.	16 to 20 Years.	21 to 29 Years.	30 to 39 Years.	40 to 49 Years.	50 to 59 Years.	60 Years and over.	Piece-workers.	Time-workers.
Other papers,	1	—	—	—	—	—	—	1	—	—	1
Printing and publishing establishments,	2	—	—	—	—	—	—	1	—	—	2
Carpet mills,	1	—	—	—	—	—	—	—	—	—	1
Cotton mills,	10	1	—	3	—	3	—	2	2	3	8
Dyeing and finishing textiles,	4	—	—	—	1	—	2	1	—	—	4
Hemp and jute mills,	1	—	—	—	—	—	—	—	—	—	1
Knitting mills,	2	1	—	—	1	—	—	—	—	—	3
Woolen and worsted mills,	9	1	—	2	1	2	3	—	—	—	9
Not specified textile workers,	2	—	—	—	—	—	—	—	—	—	2
Electric light and power companies,	18	—	—	1	7	9	1	—	1	—	18
Electrical supplies,	7	—	—	—	3	—	3	—	—	3	4
Gas works,	5	—	—	—	—	1	—	2	—	—	5
Rubber factories,	1	—	—	1	—	—	—	—	—	—	1
Tobacco,	1	—	—	—	—	—	—	—	—	—	1
Gas and electric companies,	6	—	—	1	1	4	—	—	—	—	6
Other miscellaneous industries and occupations,	1	—	—	—	—	—	—	—	1	—	1
Workers in "not specified" manufacturing and mechanical industries,	1	1	—	—	1	—	—	—	—	—	2
Water transportation,	17	—	—	—	3	6	—	3	2	—	17
Construction and maintenance of streets, roads, sewers, bridges, etc.,	60	—	—	2	9	9	21	8	11	—	60
Livery stables,	5	—	—	—	—	1	1	2	—	—	5
Truck, transfer, cab and hack companies,	17	—	—	2	2	5	5	2	2	1	16
Street railways,	13	—	—	—	—	3	3	1	1	—	13
Steam railroads,	79	—	—	3	23	19	15	11	8	—	79
Express companies,	16	—	1	—	2	2	1	1	1	—	16
Telegraph and telephone,	5	—	1	—	1	2	—	—	—	—	5
Banking and brokerage,	—	1	—	—	—	—	—	—	—	—	1
Real estate,	2	—	—	—	—	—	—	—	1	—	2
Wholesale and retail trade,	38	—	1	3	6	11	9	7	1	1	37
Warehouses and cold-storage plants,	4	—	—	—	3	—	—	—	—	—	4
Professional service (all kinds),	2	—	—	—	—	—	—	—	—	—	2
Occupations not in industries,	7	—	—	1	2	2	1	2	—	—	7
Laundries and laundry work,	1	—	—	—	—	1	—	—	—	—	1
Total,	503	6	3	35	107	113	119	81	51	13	496

TABLE XII. — *Distribution of Non-fatal Accidents by Wage Groups, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	\$6 and under.	\$6.01 to \$7.	\$7.01 to \$8.	\$8.01 to \$9.	\$9.01 to \$10.	\$10.01 to \$11.	\$11.01 to \$12.	\$12.01 to \$13.	\$13.01 to \$14.	\$14.01 to \$15.	\$15.01 to \$16.
Agriculture,	1	3	3	7	13	13	30	8	10	10	2
Forestry,	—	—	1	1	6	2	26	2	21	16	4
Animal husbandry,	1	—	1	2	3	1	3	1	1	4	3
Ice harvesting,	—	—	—	—	—	11	69	4	31	8	—
Mining,	—	—	—	—	—	—	—	—	—	—	5
Quarrying,	6	2	5	6	15	28	150	54	66	48	—
Building and hand trades,	104	23	66	135	115	397	1,501	132	710	605	229
Fertilizer makers,	—	—	—	3	14	35	15	1	3	8	1
Paint makers,	3	2	2	6	9	10	20	8	6	5	3
Powder, cartridge, fireworks, etc., makers,	5	1	3	7	2	—	11	6	2	4	—
Soap makers,	4	1	3	17	4	9	11	35	38	37	23
Other chemical workers,	33	32	23	3	3	175	87	2	6	5	—
Brick makers,	1	—	—	3	8	10	2	1	4	4	3
Potteries,	1	—	—	1	3	3	3	1	1	—	—
Tile makers,	—	—	—	6	2	10	9	8	13	18	9
Glass makers, workers,	8	5	1	1	—	—	7	—	3	—	—
Terra-cotta workers,	—	—	—	—	—	—	18	—	5	—	2
Lime, cement and gypsum,	17	—	1	3	6	17	17	5	20	25	2
Marble and stone cutters,	—	2	—	8	16	17	31	7	8	10	6
Clothing makers,	59	22	44	26	16	3	21	6	2	3	2
Corset makers,	34	8	16	15	8	5	—	—	—	—	—
Glove makers,	—	1	2	5	—	—	—	1	—	—	—
Hat makers (wool or felt),	1	1	2	—	6	3	10	3	3	1	1
Shirt, collar and cuff makers,	16	8	13	10	6	3	1	2	1	—	2
Bakers,	55	24	46	83	83	32	73	31	32	74	41
Butter and cheese makers,	—	—	—	—	—	1	1	—	—	—	—
Candy,	35	18	30	42	57	29	34	21	21	67	33
Fish cures and packers,	4	3	2	—	3	2	9	4	6	9	3
Flour and grain mills,	4	1	1	—	2	4	3	2	4	2	1
Fruit and vegetable canners, picklers, preservers,	5	4	1	1	1	1	2	—	—	1	—
Slaughter and packing houses,	12	12	26	90	145	76	78	53	53	56	29
Sugar makers and refiners,	4	—	—	4	—	2	69	24	49	6	—
Other food preparers,	5	1	11	16	23	11	31	14	32	22	20
Agricultural implements,	25	11	7	23	15	37	33	7	12	18	9
Automobile factories,	1	7	3	28	64	95	134	51	107	153	60
Car and railroad shops,	8	4	—	20	49	106	67	50	75	58	27

TABLE XII. — *Distribution of Non-fatal Accidents by Wage Groups, etc. — Continued.*

INDUSTRIES.	\$5 and under.	\$6.01 to \$7.	\$7.01 to \$8.	\$8.01 to \$9.	\$9.01 to \$10.	\$10.01 to \$11.	\$11.01 to \$12.	\$12.01 to \$13.	\$13.01 to \$14.	\$14.01 to \$15.	\$15.01 to \$16.
Foundries and metal works,	326	152	251	700	1,068	1,532	1,039	637	867	657	365
Iron and steel mills,	12	11	10	40	42	80	66	9	34	22	7
Ship and boat building,	17	10	4	150	27	87	40	1	33	67	2
Wagons and carriages,	3	-	2	6	6	10	13	3	25	23	8
Other iron and steel works,	126	99	131	307	313	369	437	297	296	426	166
Harness and saddle makers and repairers,	11	3	2	6	5	11	2	2	7	7	-
Leather belt, leather case and pocketbook makers,	12	10	9	22	24	18	25	11	13	15	2
Shoes,	523	176	395	504	308	271	483	107	313	471	89
Hatters,	38	45	124	198	237	114	130	33	67	95	30
Trunk makers,	9	2	4	1	4	2	3	-	3	-	-
Breweries,	-	1	4	1	1	2	10	11	36	26	80
Distilleries,	-	-	-	1	1	-	6	2	2	2	1
Other liquor and beverage workers,	4	1	4	18	6	23	32	26	22	25	11
Box makers (wood),	16	9	32	94	70	89	72	32	26	35	8
Furniture,	65	34	33	135	92	112	156	34	50	66	32
Pianos and organs,	34	17	41	43	25	36	47	15	27	39	14
Saw and planing mills,	2	1	3	16	20	30	48	8	22	15	6
Other woodworkers,	52	50	85	150	93	102	140	22	62	82	33
Brass mills,	7	5	19	17	14	11	21	7	24	16	2
Clock factories,	-	2	1	-	-	-	-	-	4	1	2
Copper factories,	4	1	-	18	20	9	5	1	5	2	1
Gold and silver workers,	10	4	5	10	7	10	11	4	19	10	2
Jewelry factories,	38	35	18	67	37	40	14	12	27	22	6
Lead and zinc factories,	-	-	-	-	-	3	5	2	5	1	-
Tin-plate factories,	9	14	13	19	22	12	11	4	6	3	1
Watch factories,	8	4	6	10	4	8	4	4	1	3	2
Brass and copper,	1	-	-	13	13	12	45	13	25	8	4
Other metal workers,	38	25	28	62	26	47	64	21	24	37	6
Box makers (paper),	70	26	32	42	37	24	24	6	23	13	7
Makers of blank books, envelopes, tags, paper bags, etc.,	66	42	23	22	17	13	9	3	13	10	7
Paper mills,	62	56	42	110	180	312	236	96	80	72	38
Pulp mills,	-	-	-	-	28	3	3	-	-	-	1
Other papers,	41	14	16	28	27	34	36	5	14	14	8
Printing and publishing establishments,	156	51	65	51	47	26	52	19	30	55	38
Carpet mills,	46	23	37	48	34	33	6	10	17	23	5
Cotton mills,	641	735	1,576	1,473	911	550	434	336	350	297	199
Dyeing and finishing textiles,	19	39	74	231	118	53	42	12	20	27	5
Hemp and jute mills,	49	61	64	62	87	22	22	10	6	11	15

	79	42	99	62	43	36	27	17	13	18	6
Knitting mills,	3	1	—	—	—	—	—	—	—	—	2
Lace and embroidery makers,	24	13	17	30	45	13	9	3	9	—	2
Linen mills,	52	53	102	117	45	28	18	16	18	15	3
Print works,	12	9	12	8	1	1	5	—	—	1	3
Rope and cordage factories,	—	—	—	2	—	—	—	—	4	5	1
Sail, awning and tent makers,	—	—	—	2	1	—	1	—	—	7	1
Silk mills,	21	9	15	14	8	8	12	5	6	—	1
Woolen and worsted mills,	216	320	461	799	380	212	221	126	152	152	125
Not specified textile workers,	71	42	85	79	77	59	52	26	28	8	3
Broom and brush makers,	47	17	16	6	14	7	5	10	13	13	8
Button makers,	24	13	5	12	15	16	7	3	5	3	7
Charcoal and coke burners,	—	—	—	—	—	—	1	—	—	—	—
Cigars,	7	4	4	2	3	1	4	—	—	4	3
Electric light and power companies,	6	2	3	23	10	33	123	45	143	106	58
Electrical supplies,	163	122	157	203	283	339	264	268	336	336	258
Gas works,	9	3	6	8	15	53	252	74	175	140	108
Oil works,	—	—	—	—	2	2	8	3	2	2	—
Rubber factories,	100	55	56	198	283	308	266	122	113	150	78
Shaw workers,	—	2	2	4	4	4	11	—	3	12	—
Gas and electric companies,	—	1	3	5	6	26	65	9	38	35	20
Other miscellaneous industries and occupations,	—	—	—	—	—	—	—	—	—	—	—
Workers in "not specified" manufacturing and mechanical industries,	108	53	93	156	114	121	127	42	67	75	29
Water transportation,	111	39	52	95	71	75	135	38	64	71	23
Construction and maintenance of streets, roads, sewers, bridges, etc.,	7	6	46	29	96	20	677	108	80	181	23
Livery stables,	5	4	9	19	38	164	837	88	312	405	38
Truck, transfer, cab and hack companies,	—	—	1	3	12	13	57	16	22	14	3
Street railways,	20	3	10	21	64	101	296	149	288	140	249
Steam railroads,	8	10	10	9	45	186	446	205	365	280	239
Express companies,	37	48	27	99	219	688	351	287	491	329	277
Telegraph and telephone,	10	—	4	14	22	24	104	172	181	122	29
Other persons in transportation,	7	2	5	3	3	3	41	1	28	38	3
Banking and brokerage,	1	1	3	3	—	2	3	1	4	1	—
Insurance,	4	4	3	4	4	4	3	2	2	3	1
Real estate,	8	6	3	2	5	—	7	—	—	—	—
Wholesale and retail trade,	23	22	7	7	26	24	43	7	15	14	10
Elevators,	633	230	514	434	671	467	1,484	487	985	942	395
Warehouses and cold-storage plants,	—	—	—	—	1	—	—	16	43	29	8
Other persons in trade,	—	—	—	13	6	1	7	2	10	6	2
Clerical assistants (industry, business or profession not specified),	14	5	7	—	—	—	—	—	—	—	—
Professional service (all kinds),	—	—	—	—	—	—	—	—	—	—	—
Occupations not in industries,	93	21	32	44	35	23	33	12	23	27	6
Laundries and laundry work,	249	133	113	117	173	70	49	5	89	77	37
Laundries and laundry work,	34	17	25	21	8	8	32	5	10	12	5
Total,	5,171	3,268	5,468	7,941	7,569	8,471	12,668	4,670	8,075	7,782	3,792

TABLE XII. — *Distribution of Non-fatal Accidents by Wage Groups, etc. — Continued.*

INDUSTRIES.	\$16.01 to \$17.	\$17.01 to \$18.	\$18.01 to \$19.	\$19.01 to \$20.	\$20.01 to \$21.	\$21.01 to \$22.	\$22.01 to \$23.	\$23.01 to \$24.	\$24.01 to \$25.	\$25 and over.
Agriculture,	1	2	—	1	—	1	—	—	1	1
Forestry,	7	4	—	1	—	—	—	—	—	—
Animal husbandry,	1	—	—	1	—	—	—	—	—	—
Ice harvesting,	1	—	—	—	—	—	—	—	—	—
Mining,	—	—	—	—	—	—	—	—	—	—
Quarrying,	12	9	8	14	6	—	—	—	—	—
Building and hand trades,	405	415	125	416	347	309	68	272	4	2
Fertilizer makers,	4	1	3	1	—	1	—	—	537	737
Paint makers,	—	2	2	—	—	—	1	—	—	—
Powder, cartridge, fireworks, etc., makers,	—	3	1	—	1	—	—	—	—	—
Soap makers,	1	1	1	20	7	1	—	2	3	5
Other chemical workers,	11	15	—	1	1	—	—	2	—	3
Brick makers,	1	2	—	1	1	—	—	—	1	—
Potteries,	4	1	—	—	—	—	—	—	—	—
Tile makers,	2	2	—	4	1	—	—	—	1	—
Terra-cotta workers,	6	2	1	2	—	—	—	2	—	—
Lime, cement and gypsum,	—	3	—	2	—	—	—	—	—	—
Marble and stone cutters,	—	2	—	1	1	—	—	—	—	—
Clothing makers,	9	21	40	35	14	5	3	—	7	1
Corset makers,	12	9	—	10	2	4	1	1	4	5
Glove makers,	1	—	—	—	—	—	—	—	—	—
Hat makers (wool or felt),	—	—	—	—	1	—	—	—	—	—
Shirt, collar and cuff makers,	2	4	—	1	—	—	—	—	—	—
Bakeries,	21	39	17	14	5	3	1	6	7	1
Butter and cheese makers,	—	—	—	—	—	—	—	—	—	—
Candy,	19	22	17	9	5	5	1	3	4	9
Fish curers and packers,	2	1	—	1	—	—	—	—	—	—
Flour and grain mills,	1	3	—	1	—	—	—	1	—	—
Fruit and vegetable canners, picklers, preservers,	—	—	—	—	—	—	—	—	—	—
Slaughter and packing houses,	20	38	8	14	7	3	1	1	5	1
Sugar makers and refiners,	9	22	2	4	7	—	—	—	—	—
Other food preparers,	8	9	6	6	1	2	2	—	1	2
Agricultural implement,	5	5	—	1	1	—	—	—	1	—
Automobile factories,	142	134	36	71	39	11	8	9	7	31
Car and railroad shops,	47	49	17	20	16	9	2	—	2	—
Foundries and metal working,	561	572	218	347	151	78	56	74	70	153
Iron and steel mills,	15	19	10	16	6	2	—	6	13	15

Ship and boat building,	51	63	5	11	15	-	4	1	-	5
Wagons and carriages,	7	10	2	3	9	2	-	1	-	1
Other iron and steel workers,	230	432	107	204	83	40	10	23	30	51
Harness and saddle makers and repairers,	2	4	-	3	-	-	-	1	-	2
Leather belt, leather case and pocketbook makers,	195	327	48	239	96	39	30	43	80	76
Shoes,	34	48	16	40	12	11	3	3	14	5
Tanneries,	-	-	-	-	-	-	-	-	1	-
Trunk makers,	83	82	29	94	26	7	2	9	6	15
Breweries,	1	2	-	-	-	-	-	-	-	-
Distilleries,	2	4	-	3	-	-	-	-	-	-
Other liquor and beverage workers,	12	15	1	6	11	-	1	1	2	4
Box makers (wood),	20	26	7	21	8	7	5	3	9	8
Furniture,	17	27	6	21	12	5	3	1	5	5
Pianos and organs,	8	14	-	9	2	4	7	2	2	10
Saw and planing mills,	36	69	14	31	18	48	1	15	13	5
Other woodworkers,	13	15	-	17	9	-	1	2	1	3
Brass mills,	-	1	-	2	-	-	1	1	-	-
Clock factories,	1	2	1	1	1	-	-	2	1	-
Copper factories,	11	7	3	2	1	2	3	2	4	2
Gold and silver workers,	20	22	3	10	9	5	3	2	5	10
Jewelry factories,	3	-	-	-	1	-	-	-	-	-
Lead and zinc factories,	3	3	1	3	1	1	-	3	1	1
Tin-plate factories,	6	7	3	2	2	2	-	1	-	3
Watch factories,	2	1	1	2	2	2	-	1	-	1
Brass and copper,	15	22	6	32	14	5	6	6	13	16
Other metal workers,	8	5	1	3	3	2	1	1	2	1
Box makers (paper),	5	10	3	3	27	8	14	12	6	14
Makers of blank books, envelopes, tags, paper bags, etc.,	37	66	13	32	27	-	-	2	2	-
Paper mills,	4	13	1	4	4	-	1	2	-	4
Pulp mills,	26	48	5	36	45	13	15	17	25	88
Other papers,	15	12	1	9	-	1	2	1	1	1
Printing and publishing establishments,	76	59	35	30	15	9	5	12	7	23
Carpet mills,	6	11	1	6	3	-	-	1	-	5
Cotton mills,	6	3	1	4	4	1	1	1	1	2
Dyeing and finishing textiles,	6	3	1	4	-	-	-	-	3	4
Hemp and jute mills,	6	7	1	-	-	-	-	-	-	-
Knitting mills,	6	-	-	-	-	-	-	-	-	-
Lace and embroidery makers,	2	1	-	4	4	1	1	1	-	3
Linen mills,	6	3	-	-	-	-	-	-	-	-
Print works,	1	7	-	4	4	1	1	-	-	-
Rope and cordage factories,	1	3	-	1	-	-	-	-	-	-
Sail, awning and tent makers,	4	4	-	2	-	-	-	-	-	-
Silk mills,	-	4	1	2	-	1	-	-	7	-
Woolen and worsted mills,	64	55	22	22	23	6	2	8	7	19

TABLE XII. — *Distribution of Non-fatal Accidents by Wage Groups, etc. — Concluded.*

INDUSTRIES.	\$16.01 to \$17.	\$17.01 to \$18.	\$18.01 to \$19.	\$19.01 to \$20.	\$20.01 to \$21.	\$21.01 to \$22.	\$22.01 to \$23.	\$23.01 to \$24.	\$24.01 to \$25.	\$25 and over.
Not specified textile workers.	11	7	3	4	5	3	2	—	—	3
Broom and brush makers.	7	1	1	3	—	—	1	—	—	—
Button makers.	5	—	—	1	—	—	—	—	—	—
Charcoal and coke burners.	—	—	—	—	—	—	—	—	—	—
Cigars.	1	—	—	2	—	—	—	1	2	1
Electric light and power companies.	61	146	16	31	83	6	1	10	13	47
Electrical supplies.	269	230	144	216	62	32	19	15	15	29
Gas works.	73	106	30	44	23	7	6	11	2	27
Oil works.	3	—	—	—	—	—	—	—	—	—
Rubber factories.	97	88	29	56	27	28	22	15	10	17
Straw workers.	—	11	—	—	2	—	1	1	3	5
Gas and electric companies.	16	24	3	18	8	2	1	3	4	6
Other miscellaneous industries and occupations.	27	51	13	22	17	6	3	—	4	7
Workers in "not specified" manufacturing and mechanical industries.	21	36	12	25	11	7	6	4	4	16
Water transportation.	20	29	6	19	12	6	6	12	4	21
Construction and maintenance of streets, roads, sewers, bridges, etc.	70	130	13	88	91	22	18	61	57	150
Livery stables.	—	—	—	—	1	—	—	—	—	—
Truck, transfer, cab and hack companies.	60	76	8	32	23	3	3	1	10	10
Street railways.	266	222	145	164	60	42	23	22	7	24
Steam railroads.	365	376	151	201	187	110	79	73	73	211
Express companies.	41	37	26	8	6	4	—	7	1	6
Telegraph and telephone.	34	28	5	16	19	2	2	4	—	1
Other persons in transportation.	1	5	—	1	—	—	—	—	—	3
Banking and brokerage.	2	2	—	—	—	—	—	1	1	3
Insurance.	1	2	3	4	2	2	4	6	1	12
Real estate.	11	23	2	7	7	5	4	5	6	6
Wholesale and retail trade.	207	374	120	236	52	56	17	21	98	101
Elevators.	—	1	—	—	1	2	—	—	—	2
Warehouses and cold-storage plants.	6	13	2	2	1	2	—	1	5	—
Other persons in trade.	4	4	—	3	—	—	—	—	3	—
Clerical assistants (industry, business or profession not specified).	—	—	—	—	—	—	—	—	—	1
Professional service (all kinds).	14	26	7	17	12	3	1	5	10	28
Occupations not in industries.	24	45	11	40	12	10	2	5	24	28
Laundries and laundry work.	2	9	3	7	2	2	2	—	8	4
Total.	4,085	5,029	1,612	3,194	1,807	1,022	496	842	1,272	2,148

TABLE XIII. — *Distribution of Fatal Accidents by Wage Groups, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	\$6 and under.	\$6.01 to \$7.	\$7.01 to \$8.	\$8.01 to \$9.	\$9.01 to \$10.	\$10.01 to \$11.	\$11.01 to \$12.	\$12.01 to \$13.	\$13.01 to \$14.	\$14.01 to \$15.	\$15.01 to \$16.
Agriculture,	-	-	-	-	-	2	-	-	-	1	-
Forestry,	-	-	-	-	-	-	-	-	-	-	-
Animal husbandry,	-	-	-	-	1	-	-	-	-	1	-
Ice harvesting,	-	-	1	1	3	4	8	-	-	1	-
Quarrying,	-	1	1	-	-	-	-	-	5	6	5
Building and hand trades,	-	-	-	-	1	-	-	-	-	-	-
Fertilizer makers,	-	-	-	-	-	-	-	-	-	-	-
Paint makers,	-	-	-	-	-	-	-	-	-	-	-
Powder, cartridge, fireworks, etc., makers,	-	-	-	-	-	-	2	-	-	-	-
Soap makers,	-	-	-	-	-	-	-	1	-	-	1
Other chemical workers,	1	-	-	-	1	-	-	-	1	-	-
Brick makers,	-	-	-	-	-	-	1	-	-	-	-
Marble and stone cutters,	-	-	-	-	-	-	-	-	-	-	-
Bakeries,	-	-	-	-	-	-	-	-	-	-	-
Fish curers and packers,	-	-	-	-	-	-	-	-	-	-	-
Slaughter and packing houses,	-	-	-	2	-	-	-	-	-	-	-
Other food preparers,	-	-	-	3	1	1	-	-	1	1	-
Foundries and metal working,	-	1	-	1	1	-	-	-	-	-	-
Iron and steel mills,	-	-	-	1	1	-	-	-	-	1	-
Ship and boat building,	-	-	-	-	-	-	1	-	-	-	-
Wagons and carriages,	-	-	-	-	-	1	3	-	-	-	-
Other iron and steel workers,	-	1	1	-	-	1	1	-	-	-	1
Leather belt, leather case and pocketbook makers,	-	-	-	-	-	-	-	-	-	-	-
Shoes,	1	-	1	1	3	1	-	-	-	-	1
Tanneries,	-	-	-	-	-	-	-	-	-	-	-
Trunk makers,	1	-	-	-	-	-	-	-	-	-	-
Breweries,	-	-	-	-	-	-	-	-	-	-	-
Other liquor and beverage workers,	-	-	-	-	-	1	-	-	-	-	-
Box makers (wood),	-	-	-	-	-	-	-	-	1	1	-
Furniture,	-	-	-	-	-	-	-	-	-	-	-
Pianos and organs,	1	-	-	-	-	-	-	-	-	1	-
Other woodworkers,	-	-	-	1	-	-	-	-	-	-	-
Copper factories,	-	-	-	-	-	1	-	-	-	-	-
Other metal workers,	-	-	-	-	-	-	-	-	-	-	-
Paper mills,	-	-	-	-	1	2	1	1	-	-	-

TABLE XIII. — *Distribution of Fatal Accidents by Wage Groups, etc. — Continued.*

INDUSTRIES.	\$6 and under.	\$6.01 to \$7.	\$7.01 to \$8.	\$8.01 to \$9.	\$9.01 to \$10.	\$10.01 to \$11.	\$11.01 to \$12.	\$12.01 to \$13.	\$13.01 to \$14.	\$14.01 to \$15.	\$15.01 to \$16.
Other papers,	-	-	-	1	-	-	-	-	-	-	-
Printing and publishing establishments,	-	-	-	1	-	-	-	-	-	-	-
Carpet mills,	-	-	2	1	1	-	-	1	-	1	2
Cotton mills,	-	2	-	2	-	-	-	-	-	-	-
Dyeing and finishing textiles,	-	-	-	-	-	-	1	-	1	-	-
Hemp and jute mills,	-	-	3	-	-	-	-	-	-	-	-
Knitting mills,	-	-	1	2	-	-	1	1	-	1	-
Woolen and worsted mills,	-	2	1	-	-	-	-	-	-	-	-
Not specified textile workers,	-	-	1	-	-	-	-	-	-	-	-
Electric light and power companies,	-	-	-	2	-	1	1	1	3	1	1
Electrical supplies,	-	-	2	-	-	-	-	-	-	2	-
Gas works,	-	-	-	-	-	-	-	-	-	-	-
Rubber factories,	1	-	-	-	-	-	-	-	-	-	-
Tobacco,	-	-	-	-	-	-	-	-	-	-	-
Gas and electric companies,	-	-	-	-	-	2	-	-	1	1	1
Other miscellaneous industries and occupations,	-	-	-	-	-	-	-	-	-	-	-
Workers in "not specified" manufacturing and mechanical industries,	-	-	-	-	-	-	1	-	-	-	-
Water transportation,	1	-	-	1	1	-	-	-	2	3	-
Construction and maintenance of streets, roads, sewers, bridges, etc.,	-	-	-	2	3	4	13	3	1	19	3
Livery stables,	-	-	-	-	2	-	2	-	1	-	-
Truck, transfer, cab and hack companies,	1	-	-	-	2	1	4	1	2	1	1
Street railways,	-	-	-	-	-	1	1	2	2	1	2
Steam railroads,	-	-	-	1	5	17	5	4	4	6	3
Express companies,	2	-	-	1	-	-	3	-	1	-	-
Telegraph and telephone,	1	-	-	-	-	-	-	-	-	2	-
Banking and brokerage,	1	1	-	-	-	-	-	-	-	-	-
Real estate,	1	1	-	-	-	-	-	-	-	-	-
Wholesale and retail trade,	1	-	-	-	-	-	-	-	-	-	1
Warehouses and cold-storage plants,	2	-	-	-	-	1	9	5	8	6	-
Professional service (all kinds),	-	-	-	-	-	-	3	1	1	-	-
Occupations not in industries,	-	-	-	-	-	-	-	-	-	-	-
Laundries and laundry work,	-	1	-	-	2	-	-	-	2	-	-
Total,	13	7	13	23	32	42	78	20	40	59	25

TABLE XIII. — *Distribution of Fatal Accidents by Wage Groups, etc.* — Continued.

INDUSTRIES.	\$16.01 to \$17.	\$17.01 to \$18.	\$18.01 to \$19.	\$19.01 to \$20.	\$20.01 to \$21.	\$21.01 to \$22.	\$22.01 to \$23.	\$23.01 to \$24.	\$24.01 to \$25.	\$25 and over.
Agriculture,	-	-	-	-	-	-	-	-	-	-
Forestry,	-	-	1	-	-	-	-	-	-	-
Animal husbandry,	-	-	-	-	-	-	-	-	-	-
Ice harvesting,	-	-	-	-	-	-	-	-	-	-
Quarrying,	4	8	1	2	3	5	1	2	5	9
Building and hand trades,	-	-	-	-	-	-	-	-	-	-
Fertilizer makers,	-	-	-	-	-	-	-	-	-	-
Paint makers,	-	1	-	-	-	-	-	-	-	-
Powder, cartridge, fireworks, etc., makers,	-	-	-	-	-	-	-	-	-	-
Soap makers,	1	-	-	-	-	-	-	-	-	-
Other chemical workers,	-	-	-	-	-	-	-	-	-	-
Brick makers,	-	-	-	-	-	-	-	-	-	-
Marble and stone cutters,	-	-	1	-	-	-	-	-	-	-
Bakeries,	-	-	-	-	-	-	-	-	-	-
Fish curers and packers,	1	1	-	-	-	-	-	-	-	-
Slaughter and packing houses,	-	-	-	-	-	-	-	-	-	-
Other food preparers,	-	1	2	1	-	-	-	-	-	-
Foundries and metal working,	-	-	-	-	-	-	-	-	-	-
Iron and steel mills,	-	-	-	-	-	-	-	-	-	-
Ship and boat building,	-	1	-	-	-	1	-	-	-	1
Wagons and carriages,	-	1	-	-	-	-	-	-	-	-
Other iron and steel workers,	2	-	-	-	1	-	-	-	-	-
Leather belt, leather case and pocketbook makers,	-	-	-	-	-	-	-	-	-	-
Shoes,	-	-	-	-	-	-	-	-	-	-
Tanneries,	-	-	-	-	1	-	-	-	-	-
Trunk makers,	-	-	-	-	-	-	-	-	-	-
Breweries,	1	2	-	-	-	1	-	-	-	-
Other liquor and beverage workers,	-	-	-	-	-	-	-	-	-	-
Box makers (wood),	-	-	-	-	-	-	-	-	-	-
Furniture,	-	-	-	-	-	-	-	-	-	-
Pianos and organs,	-	-	-	1	-	-	-	-	-	1
Other woodworkers,	-	-	1	-	-	-	-	-	-	-
Copper factories,	-	-	-	-	-	-	-	-	-	-
Other metal workers,	-	-	-	-	-	-	-	-	-	-
Paper mills,	-	3	1	1	-	-	-	-	1	-

TABLE XIII. — *Distribution of Fatal Accidents by Wage Groups, etc. — Concluded.*

INDUSTRIES.	\$16.01 to \$17.	\$17.01 to \$18.	\$18.01 to \$19.	\$19.01 to \$20.	\$20.01 to \$21.	\$21.01 to \$22.	\$22.01 to \$23.	\$23.01 to \$24.	\$24.01 to \$25.	\$25 and over.
Other papers.	—	—	—	—	—	1	—	—	—	1
Printing and publishing establishments,	—	—	—	—	—	—	—	—	—	—
Carpet mills,	—	—	—	—	—	—	—	—	—	—
Cotton mills,	—	—	—	—	—	—	—	—	—	—
Dyeing and finishing textiles,	1	—	1	—	—	—	—	1	—	—
Hemp and jute mills,	—	—	—	—	—	—	—	—	—	—
Knitting mills,	—	—	—	—	—	—	—	—	—	—
Woolen and worsted mills,	—	2	—	—	—	—	—	—	—	—
Not specified textile workers.	—	3	—	—	4	—	1	—	—	1
Electric light and power companies,	1	—	1	—	—	—	—	—	—	—
Electrical supplies,	—	—	1	—	—	—	—	—	—	—
Gas works,	—	—	—	—	—	—	—	—	—	—
Rubber factories,	—	—	—	—	—	—	—	—	—	—
Tobacco,	—	—	—	—	—	—	—	—	—	—
Gas and electric companies,	1	—	—	—	—	—	—	—	—	—
Other miscellaneous industries and occupations,	—	—	—	—	—	—	—	—	—	—
Workers in "not specified" manufacturing and mechanical industries,	—	—	—	—	—	—	—	1	—	—
Water transportation,	—	—	—	—	—	—	—	—	—	—
Construction and maintenance of streets, roads, sewers, bridges, etc.,	2	5	—	—	—	—	1	—	1	3
Livery stables,	—	—	—	—	—	—	—	—	—	—
Truck, transfer, cab and hack companies,	2	1	—	1	—	—	—	—	—	—
Street railways,	2	1	—	—	—	—	—	—	—	—
Steam railroads,	3	5	1	2	6	2	2	4	3	6
Express companies,	—	—	—	—	—	—	—	—	—	—
Telegraph and telephone,	—	—	—	—	—	—	—	—	—	—
Banking and brokerage,	—	—	—	—	—	—	—	1	—	1
Real estate,	—	—	—	—	—	—	—	—	—	—
Wholesale and retail trade,	1	3	—	2	—	—	—	—	1	—
Warehouses and cold-storage plants,	—	—	—	—	—	—	—	—	—	—
Professional service (all kinds),	—	—	—	—	—	—	—	—	—	—
Occupations not in industries,	—	1	—	1	—	—	—	—	—	—
Laundries and laundry work,	—	—	—	—	—	—	—	—	—	—
Total,	22	37	10	13	16	10	5	9	11	21

TABLE XIV. — Duration of Total Disability in Non-fatal Accident Cases, etc. — Concluded.

INDUSTRIES.	Less than 1 Day.	1 to 3 Days.	4 to 7 Days.	8 to 10 Days.	11 to 14 Days.	15 to 28 Days.	4 to 8 Weeks.	8 to 13 Weeks.	13 to 25 Weeks.	26 to 51 Weeks.	1 Year and over.
Foundries and metal working,	5,305	1,101	1,105	356	419	689	510	156	60	22	11
Iron and steel mills,	138	78	82	23	23	34	42	10	5	—	—
Ship and boat building,	—	49	52	73	86	123	64	23	13	6	1
Wagons and carriages,	—	10	24	4	8	12	9	8	3	—	—
Other iron and steel workers,	1,335	543	695	228	301	395	237	90	45	12	6
Harness and saddle makers and repairers,	—	14	13	5	1	7	5	1	1	—	—
Leather belt, leather case and pocketbook makers,	—	20	35	11	13	23	15	3	—	1	—
Shoes,	58	20	35	11	13	23	15	3	—	1	—
Tanneries,	2,586	419	454	141	204	427	301	119	72	21	6
Trunk makers,	651	132	148	61	53	114	90	28	16	3	1
Breweries,	11	—	10	2	1	2	2	—	—	—	—
Distilleries,	186	63	68	36	30	60	44	20	11	2	1
Other liquor and beverage workers,	6	1	4	2	—	2	1	1	—	—	—
Box makers (wood),	87	13	25	8	12	21	9	4	3	—	—
Furniture,	193	60	58	27	42	60	59	17	11	3	6
Pianos and organs,	370	107	126	49	59	113	70	15	10	2	1
Saw and planing mills,	211	52	46	20	23	45	21	12	7	2	2
Other woodworkers,	48	26	26	9	17	33	27	16	11	1	1
Brass mills,	416	127	150	43	77	129	111	43	24	5	7
Clock factories,	106	21	26	18	13	18	9	4	1	—	—
Copper factories,	7	—	3	—	—	—	1	1	1	1	—
Gold and silver workers,	22	14	13	3	3	9	9	1	—	—	—
Jewelry factories,	54	12	18	3	10	14	10	3	1	—	—
Lead and zinc factories,	227	30	51	15	11	36	19	10	3	—	—
Tin-plate factories,	6	4	1	1	2	—	2	1	—	—	—
Brass and copper,	56	18	19	6	7	10	7	3	1	1	—
Other metal workers,	72	5	6	3	—	1	2	—	—	—	—
Box makers (paper),	201	17	21	7	3	9	9	4	2	—	—
Makers of blank books, envelopes, tags, paper bags, etc.,	103	28	44	19	21	49	48	11	7	1	—
Paper mills,	120	31	31	13	15	22	15	4	3	—	—
Pulp mills,	502	197	226	91	115	191	119	50	17	5	—
Other papers,	14	3	6	4	2	3	2	1	1	—	—
Printing and publishing establishments,	94	28	39	15	25	37	19	7	6	1	1
Carpet mills,	398	105	87	42	59	96	76	28	12	2	3
Cotton mills,	141	47	44	21	21	26	16	5	2	—	—
Dyeing and finishing textiles,	2,548	976	1,263	424	560	856	693	242	144	38	29
Hemp and jute mills,	280	81	100	35	32	69	43	18	11	3	1
	147	56	73	26	47	49	14	7	3	1	—

	190	72	57	32	34	44	22	10	4	2	
Knitting mills,	190	72	57	32	34	44	22	10	4	2	
Lace and embroidery makers,	2	2	1	1	1	1	1	1	1	1	
Linon mills,	48	16	24	11	10	10	8	5	3	2	
Print works,	274	56	59	26	26	49	34	17	8	3	
Rope and cordage factories,	26	7	8	6	5	13	10	5	1	3	
Sail awning and tent makers,	5	5	4	1	1	3	3	1	1	1	
Silk mills,	55	13	20	5	8	13	10	1	1	1	
Woolen and worsted mills,	341	396	136	136	183	318	224	80	56	11	
Not specified textile workers,	1,652	83	34	41	49	49	31	14	6	2	
Broom and brush makers,	117	10	13	4	4	4	1	2	2	2	
Button makers,	24	33	11	11	4	11	4	3	2	2	
Charcoal and coke burners,	1	1	5	4	2	6	2	3	1	1	
Cigars,	11	9	5	4	2	6	4	2	4	1	
Electric light and power companies,	645	64	78	23	29	56	40	15	13	2	
Electrical supplies,	2,194	478	392	114	147	224	137	46	19	3	
Gas works,	666	143	143	54	45	69	64	17	8	4	
Oil works,	11	6	4	1	1	1	2	3	1	1	
Rubber factories,	981	313	306	99	132	94	94	41	14	4	
Straw workers,	26	6	10	2	2	5	9	2	7	1	
Gas and electric companies,	123	46	38	14	23	22	22	3	7	2	
Other miscellaneous industries and occupations,	581	142	151	47	53	83	50	15	11	2	
Workers in "not specified" manufacturing and me- chanical industries,	435	115	109	34	40	68	67	28	15	5	
Water transportation,	393	177	212	84	80	158	191	61	35	10	
Construction and maintenance of streets, roads, sewers, bridges, etc.,	850	338	382	144	159	310	265	85	60	18	
Livery stables,	39	18	17	2	3	25	26	10	3	2	
Truck, transfer, cab and hack companies,	328	195	248	105	106	204	212	83	57	21	
Street railways,	998	454	427	164	148	225	203	83	53	8	
Steam railroads,	1,948	575	634	253	266	498	322	110	56	22	
Express companies,	242	139	154	55	54	95	51	16	11	2	
Telegraph and telephone,	18	30	51	20	26	49	29	12	8	1	
Other persons in transportation,	10	2	5	2	2	5	2	2	1	1	
Banking and brokerage,	14	4	4	3	3	4	4	1	1	1	
Insurance,	30	6	10	1	4	5	6	1	3	2	
Real estate,	101	18	31	14	14	38	31	15	3	4	
Wholesale and retail trade,	3,546	910	1,100	423	441	935	701	248	155	45	
Elevators,	115	35	45	10	6	19	14	5	2	1	
Warehouses and cold-storage plants,	26	6	10	5	6	9	7	3	2	1	
Other persons in trade,	1	1	23	1	23	19	14	5	1	1	
Clerical assistants (industry, business or profession not specified),	1	1	17	7	19	35	39	15	8	1	
Professional service (all kinds),	240	50	43	17	19	35	39	15	8	1	
Occupations not in industries,	549	153	196	74	97	175	125	50	23	4	
Laundries and laundry work,	67	15	37	7	9	31	35	7	5	2	
Total,	41,269	11,458	12,843	4,517	5,236	9,222	7,066	2,549	1,491	438	293

[illegible]

Workers in "not specified" manufacturing and mechanical industries, . . .	1	2	1	1	2	2	77	38	22	1	1	112	9	804	42
Water transportation, . . .	-	-	-	-	-	-	2	1	-	-	-	1	-	16	2
Construction and maintenance of streets, roads, sewers, bridges, etc., . . .	-	-	1	-	1	-	7	-	1	-	-	1	2	10	3
Livery stables, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	11	3
Truck, transfer, cab and hack companies, . . .	-	-	-	-	-	-	-	-	2	-	-	1	-	-	2
Street railways, . . .	-	1	-	-	-	-	1	1	3	-	-	2	1	4	3
Steam railroads, . . .	-	1	-	-	1	-	1	5	6	-	-	2	1	9	3
Express companies, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telegraph and telephone, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other persons in transportation, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Banking and brokerage, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insurance, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Real estate, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wholesale and retail trade, . . .	-	-	-	-	-	-	4	-	-	-	-	2	2	37	2
Elevators, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Warehouses and cold-storage plants, . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Other persons in trade, . . .	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Clerical assistants (industry, business or profession not specified), . . .	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Professional service (all kinds), . . .	-	-	-	-	-	-	-	1	-	-	-	2	-	1	2
Occupations not in industries, . . .	-	-	-	-	-	-	-	-	-	-	-	1	-	5	-
Laundries and laundry work, . . .	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-
Total, . . .	1	2	1	1	2	2	77	38	22	1	1	112	9	804	42

TABLE XVI. — *Distribution of Non-fatal Accidents by Degree of Disability, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	Per- manent Total.	Per- manent Partial.	Tem- porary Total.	Minor.
Agriculture,	-	4	82	21
Forestry,	-	2	65	20
Animal husbandry,	-	-	17	4
Ice harvesting,	-	1	105	27
Mining,	-	1	4	1
Quarrying,	-	11	311	122
Building and hand trades,	3	67	4,461	3,107
Fertilizer makers,	-	1	77	12
Paint makers,	-	1	35	44
Powder, cartridge, fireworks, etc., makers,	-	-	12	13
Soap makers,	-	1	42	12
Other chemical workers,	-	3	236	365
Brick makers,	-	1	52	11
Potteries,	-	-	24	16
Tile makers,	-	-	8	7
Glass makers, workers,	-	-	55	52
Terra-cotta workers,	-	-	9	7
Lime, cement and gypsum,	-	-	56	10
Marble and stone cutters,	-	6	206	75
Clothing makers,	-	1	139	131
Corset makers,	-	1	30	63
Glove makers,	-	-	1	1
Hat makers (wool or felt),	-	-	22	19
Shirt, collar and cuff makers,	-	1	21	47
Bakeries,	-	11	300	369
Butter and cheese makers,	-	-	1	1
Candy,	-	3	246	243
Fish curers and packers,	-	-	47	6
Flour and grain mills,	-	1	20	10
Fruit and vegetable canners, picklers, preservers,	-	-	1	17
Slaughter and packing houses,	-	6	399	321
Sugar makers and refiners,	-	2	102	106
Other food preparers,	-	6	144	103
Agricultural implements,	-	4	103	75
Automobile factories,	-	13	300	881
Car and railroad shops,	-	7	210	460
Foundries and metal working,	-	85	3,988	5,861
Iron and steel mills,	-	8	268	159
Ship and boat building,	-	8	524	61
Wagons and carriages,	-	3	73	58
Other iron and steel workers,	-	67	2,344	1,676
Harness and saddle makers and repairers,	-	1	40	18
Leather belt, leather case and pocketbook makers,	-	4	111	64
Shoes,	-	63	2,039	2,711
Tanneries,	-	19	596	682
Trunk makers,	-	-	17	11
Breweries,	-	1	318	202
Distilleries,	-	-	10	7
Other liquor and beverage workers,	-	2	89	91
Box makers (wood),	-	17	310	209
Furniture,	-	13	501	405
Pianos and organs,	-	8	205	228
Saw and planing mills,	-	12	150	53
Other woodworkers,	1	57	614	460
Brass mills,	-	2	92	112
Clock factories,	-	-	8	7
Copper factories,	-	1	49	25
Gold and silver workers,	-	8	61	57
Jewelry factories,	-	11	160	240
Lead and zinc factories,	-	-	13	7
Tin-plate factories,	-	3	60	65
Watch factories,	-	-	15	74
Brass and copper,	-	-	65	79
Other metal workers,	-	14	267	232
Box makers (paper),	-	10	217	107
Makers of blank books, envelopes, bags, paper bags, etc.,	-	3	122	128
Paper mills,	-	27	932	554
Pulp mills,	-	1	20	15
Other papers,	1	5	165	101

TABLE XVI. — *Distribution of Non-fatal Accidents, etc.* — Concluded.

INDUSTRIES.	Per- manent Total.	Per- manent Partial.	Tem- porary Total.	Minor.
Printing and publishing establishments, . . .	1	16	458	433
Carpet mills,	—	2	163	160
Cotton mills,	3	139	4,817	2,814
Dyeing and finishing textiles,	—	10	359	304
Hemp and jute mills,	—	5	258	160
Knitting mills,	—	3	253	213
Lace and embroidery makers,	—	—	2	4
Linen mills,	—	4	81	53
Print works,	—	8	256	229
Rope and cordage factories,	—	6	51	26
Sail, awning and tent makers,	—	—	13	6
Silk mills,	—	4	62	59
Woolen and worsted mills,	—	53	1,599	1,740
Not specified textile workers,	—	8	304	277
Broom and brush makers,	—	1	36	120
Button makers,	—	4	83	30
Charcoal and coke burners,	—	—	1	—
Cigars,	—	—	30	13
Electric light and power companies,	—	3	299	664
Electrical supplies,	—	27	1,349	2,378
Gas works,	—	7	466	699
Oil works,	—	—	16	13
Rubber factories,	—	14	1,050	1,063
Straw workers,	—	2	32	28
Gas and electric companies,	—	—	162	130
Other miscellaneous industries and occupations,	—	27	479	629
Workers in "not specified" manufacturing and mechanical industries,	—	20	429	467
Water transportation,	—	16	963	432
Construction and maintenance of streets, roads, sewers, bridges, etc.,	3	27	1,644	945
Livery stables,	—	—	163	42
Truck, transfer, cab and hack companies,	1	11	1,185	370
Street railways,	1	15	1,660	1,102
Steam railroads,	5	26	2,005	2,073
Express companies,	—	3	550	268
Telegraph and telephone,	—	—	224	24
Other persons in transportation,	—	—	15	11
Banking and brokerage,	—	—	23	15
Insurance,	—	—	34	32
Real estate,	—	—	165	106
Wholesale and retail trade,	—	48	4,688	3,788
Elevators,	—	—	3	—
Warehouses and cold-storage plants,	—	2	144	122
Other persons in trade,	—	—	49	26
Clerical assistants (industry, business or profes- sion not specified),	—	—	—	1
Professional service (all kinds),	1	5	212	254
Occupations not in industries,	—	9	861	587
Laundries and laundry work,	—	3	140	73
Total,	20	1,136	50,765	44,461

TABLE XVII. — *Conjugal Condition and Dependency in Fatal Accident Cases, July 1, 1913, to June 30, 1914.*

INDUSTRIES.	Single.	Married.	Widower.	Divorced.	Number of Whole Dependents.	Number of Partial Dependents.	Cases in which there were no Dependents.
Agriculture,	1	2	-	-	2	1	-
Forestry,	1	-	-	-	-	-	1
Animal husbandry,	-	1	-	-	1	-	-
Ice harvesting,	1	-	-	-	-	1	-
Quarrying,	1	2	-	-	6	1	-
Building and hand trades,	26	43	4	1	156	25	11
Fertilizer makers,	-	1	-	-	2	-	-
Paint makers,	-	1	-	-	1	-	-
Powder, cartridge, fireworks, etc., makers,	-	2	-	-	6	-	-
Soap makers,	-	1	-	-	3	-	-
Other chemical workers,	3	1	1	-	7	3	-
Brick makers,	-	1	-	-	3	-	-
Marble and stone cutters,	-	2	-	-	5	-	-
Bakeries,	-	1	-	-	5	-	-
Fish curers and packers,	-	1	-	-	5	-	-
Slaughter and packing houses,	1	5	-	-	20	2	-
Other food preparers,	1	-	-	-	-	-	1
Foundries and metal working,	2	9	1	-	27	2	2
Iron and steel mills,	1	1	-	-	3	-	1
Ship and boat building,	2	4	-	-	7	1	1
Wagons and carriages,	-	1	-	-	7	-	-
Other iron and steel workers,	1	7	-	-	11	2	-
Leather belt, leather case and pocketbook makers,	1	1	-	-	5	-	-
Shoes,	4	-	-	-	-	9	1
Tanneries,	2	6	1	-	16	1	1
Trunk makers,	1	-	-	-	1	-	-
Breweries,	-	4	-	-	9	-	-
Other liquor and beverage workers,	1	-	-	-	-	1	-
Box makers (wood),	-	1	-	-	1	-	-
Furniture,	-	2	-	-	9	-	-
Pianos and organs,	1	1	-	-	2	2	-
Other woodworkers,	2	1	1	-	1	3	1
Copper factories,	-	1	-	-	1	-	-
Other metal workers,	-	1	-	-	-	4	-
Paper mills,	1	7	2	-	23	2	-
Other papers,	-	1	-	-	1	-	-
Printing and publishing establishments,	-	2	-	-	3	-	-
Carpet mills,	1	-	-	-	-	1	-
Cotton mills,	5	6	-	-	16	-	2
Dyeing and finishing textiles,	-	4	-	-	15	-	-
Hemp and jute mills,	-	1	-	-	4	-	-
Knitting mills,	1	2	-	-	3	-	1
Woolen and worsted mills,	4	6	-	-	17	2	2
Not specified textile workers,	1	1	-	-	3	1	-
Electric light and power companies,	7	11	-	-	27	12	3
Electrical supplies,	4	2	1	-	3	8	1
Gas works,	1	2	2	-	14	-	2
Rubber factories,	1	-	-	-	2	-	-
Tobacco,	1	-	-	-	-	-	1
Gas and electric companies,	1	5	-	-	21	-	-
Other miscellaneous industries and occupations,	-	1	-	-	1	-	-
Workers in "not specified" manufacturing and mechanical industries,	2	-	-	-	-	2	1
Water transportation,	9	7	1	-	14	5	6
Construction and maintenance of streets, roads, sewers, bridges etc.,	13	39	8	-	139	8	10
Livery stables,	-	4	1	-	13	1	-
Truck, transfer, cab and hack companies,	10	7	-	-	14	3	9
Street railways,	5	8	-	-	20	4	2
Steam railroads,	30	44	4	1	132	20	16

TABLE XVII. — *Conjugal Condition and Dependency, etc.* — Concluded.

INDUSTRIES.	Single.	Married.	Widower.	Divorced.	Number of Whole Dependents.	Number of Partial Dependents.	Cases in which there were no Dependents.
Express companies,	3	2	1	—	6	5	2
Telegraph and telephone,	2	3	—	—	18	2	—
Banking and brokerage,	1	—	—	—	—	—	1
Real estate,	—	2	—	—	2	—	—
Wholesale and retail trade,	10	24	4	—	82	6	7
Warehouses and cold-storage plants,	2	2	—	—	4	3	—
Professional service (all kinds),	—	2	—	—	7	—	—
Occupations not in industries,	2	5	—	—	12	1	1
Laundries and laundry work,	—	1	—	—	4	—	—
Total,	170	305	32	2	942	144	87

TABLE XVIII. — *Statistical Table showing Transactions by All Insurance Companies during Year July 1, 1913, to June 30, 1914, inclusive.*

1. Number of employees receiving medical services only,	42,798
2. Number of employees receiving compensation only,	3,008
3. Number of employees receiving both medical services and compensation,	14,029
4. Number of cases reported requiring neither payment of compensation nor medical expense,	28,118
5. Number of fatal injury cases reported in which dependents totally dependent for support upon the employee were left, under section 6, Part II. of the act,	219
6. Number of fatal injury cases in which dependents partially dependent were left,	69
7. Number of fatal injury cases in which no dependents were left,	37
8. Total compensation paid all injured employees and dependents of all fatally injured employees,	\$882,162 30
9. Payments covering medical and hospital services and medicines, under section 5, Part II. of the act,	\$446,171 52
10. Estimated liability on account of compensation due injured employees and their dependents, covering the amount of deferred payments for losses incurred and the estimated cost of undetermined losses,	\$1,183,340 16
11. Estimated liability on account of medical services rendered, but not yet paid,	\$110,078 93
12. Compensation paid in fatal injury cases in which dependents totally dependent survived,	\$57,396 33
13. Estimated liability on account of deferred payments under item 12,	\$440,279 74
14. Compensation paid in fatal injury cases in which dependents partially dependent survived,	\$12,171 25
15. Estimated liability on account of deferred payments under item 14,	\$59,830 26
16. Payments covering fatal injury cases where no dependents survived, under section 8, Part II. of the act,	\$3,611 03
17. Estimated liability on account of deferred payments under section 8, Part II. of the act,	\$5,417 14

TABLE XIX. — *Study Showing Condition of Dependents in Certain Uninsured Fatal Cases.*

Re- port Num- ber.	Industry.	Occupation.	Age.	Wage.	Amount Payable under Act in Analogous Cases.	Dependents.	Settlement.	Financial Condition.
95	Steam railroad, . . .	Brakeman, . . .	26	\$17 00	\$2,550 00	Widow and two chil- dren.	No settlement,	Widow had small amount of money which is practically gone since employee's death. Finds it dif- ficult to provide for herself and two small children.
883	Steam railroad, . . .	Machinist helper, . . .	20	12 75	965 25	Parents, . . .	No settlement yet. Case in lawyer's hands.	Father and two sisters at work. Deceased employee aided in sup- port of six brothers and sisters who are in school.
7611	Manufacture of elec- trical supplies.	Press hand, . . .	26	7 78	600 00	Mother, . . .	\$100, . . .	Financial condition of dependents is not good.
1717	Steam railroad, . . .	Brakeman, . . .	22	18 00	1,350 00	Mother, . . .	\$300, . . .	Father became insane as result of son's death, and is in hospital. Small insurance paid funeral ex- penses. Mother supported by son who is employed temporarily at present.
4108	Steam railroad, . . .	Trackman, . . .	45	10 20	1,530 00	Widow and two chil- dren.	\$2,000, . . .	No further information obtainable.
4451	Steam railroad, . . .	Second hand, . . .	51	12 90	1,935 00	Sister (invalid), . . .	\$500, . . .	Sister was wholly dependent upon employee. Has no means of any kind except \$300 remaining after funeral expenses were paid.
5451	Steam railroad, . . .	Conductor, . . .	36	25 90	3,000 00	Widow and four chil- dren.	No settlement,	Family in poor circumstances. Have had illness since death of employee.
6158	Steam railroad, . . .	Track walker, . . .	48	11 05	1,657 50	Widow and three children.	\$350, . . .	No further information obtainable.
8641	Forestry, . . .	Care of trees, . . .	21	15 00	1,125 00	Mother, . . .	No settlement yet, . . .	One son now supports mother. Moderate circumstances.
8766	Tannery, . . .	Tanner, . . .	33	10 44	1,566 00	Widow and two chil- dren.	\$3,000, . . .	No further information obtainable.

TABLE XIX. — Study Showing Condition of Dependents in Certain Uninsured Fatal Cases — Continued.

Report Number.	Industry.	Occupation.	Age.	Wage.	Amount Payable under Act in Analogous Cases.	Dependents.	Settlement.	Financial Condition.
36303	Rendering, . . .	Teamster, . . .	43	\$15 00	\$2,250 00	Widow and six children.	No settlement,	Life insurance of \$200 paid to widow. Oldest boy (16 years) earns small wages. Youngest child is 4 years of age.
18315	Steam railroad, . . .	Fireman, . . .	25	18 30	1,372 50	Mother, . . .	No settlement,	No further information obtainable.
18754	Steam railroad, . . .	Section hand, . . .	46	10 80	1,620 00	Widow and five children (oldest 10 years).	No settlement,	Widow has no means of support and is dependent upon city and charitable societies.
19494	Steam railroad, . . .	Freight brakeman, . . .	35	18 00	2,700 00	Widow and three children.	No settlement,	No further information obtainable.
20377	Steam railroad, . . .	Section laborer, . . .	42	10 20	1,530 00	Widow and five children.	No settlement,	No further information obtainable.
20392	Steam railroad, . . .	Crossing tender, . . .	50	10 85	1,627 50	Widow and three children.	No settlement,	Insurance amounting to \$500. Widow works to support family. Youngest child 10 years old. Poor circumstances.
22194	Municipal corporation, . . .	Laborer, . . .	73	15 00	2,250 00	Widow, . . .	Suit pending, . . .	Family in moderate circumstances.
24792	Telephone company, . . .	Head lineman, . . .	31	24 00	3,000 00	Widow and five children.	\$3,700, . . .	Widow works to support family. Oldest child is 10 years old. Moderate circumstances.
38640	Steam railroad, . . .	Laborer, . . .	23	13 44	200 00	No dependents, . . .	No settlement,	No further information obtainable.
27200	Building contractor, . . .	Teamster and general work, . . .	43	12 00	900 00	Widowed mother (70 years of age), . . .	\$140 for expense of last sickness and burial.	Mother now dependent upon married daughter. Single son who helped to support her died four months after deceased employee.
27908	Steam railroad, . . .	Chainman, . . .	19	11 20	200 00	No dependents, . . .	No settlement,	No further information obtainable.
28706	Steam railroad, . . .	Telegrapher, . . .	53	14 98	200 00	No dependents, . . .	No settlement yet, . . .	Employer offered to pay funeral expenses.

	Garage,	Helper,	21	4 00	200 00	No dependents,	No settlement,	Employee lived with parents who did not try to obtain a settlement. Employed as result of accident that caused employee's death. No further information obtainable.
35041								
36695	Steam railroad,	Car oiler,	28	15 00	2,340 00	Widow and one child.	\$4,170,	No further information obtainable.
36696	Steam railroad,	Car repairer in yard,	29	16 55	1,241 25	Father,	\$3,300,	No further information obtainable.
36697	Steam railroad,	Car repairer in yard,	29	15 30	1,147 50	Father,	No settlement,	No further information obtainable.
38342	Steam railroad,	Laborer on work train,	35	10 20	1,530 00	Widow and three children.	No settlement,	No further information obtainable.
38343	Steam railroad,	Laborer on work train,	23	10 20	1,530 00	Widow,	No settlement,	No further information obtainable.
38344	Steam railroad,	Work train laborer,	30	10 20	1,530 00	Widow and one child.	No settlement,	No further information obtainable.
38439	Steam railroad,	Carpenter's helper,	24	10 50	787 50	Mother in Europe,	\$3,500,	No further information obtainable.
43149	Steam railroad,	Ash-pan cleaner,	38	13 45	2,017 50	Widow and three children.	No settlement,	No further information obtainable.
43294	Steam railroad,	Section man,	19	9 60	200 00	No dependents,	No settlement,	No further information obtainable.
47895	Steam railroad,	Crossing tender,	84	10 85	1,627 50	Widow,	\$300,	Widow now dependent on charity.
50556	Steam railroad,	Brakeman,	60	20 40	200 00	No dependents,	No settlement,	Son paid funeral expenses. Moderate circumstances.
50647	Municipal corporation,	Assistant drawtender,	78	17 30	1,297 50	Sister,	\$400,	Dependent will be amply provided for by estate of the deceased employee.
52259	Steam railroad,	Freight conductor,	45	25 00	3,000 00	Widow and three children.	\$250,	Widow now supports family by conducting a candy store. Widow and two children in poor health.
52978	Steam railroad,	Brakeman,	35	25 00	3,000 00	Mother,	\$1,200,	Employee was sole support of mother who is left with no income but the settlement from employer.
54808	Steam railroad,	Mechanical,	34	28 00	3,000 00	Three children (oldest 6 years).	No settlement yet,	Widow died four months after death of employee, leaving children with income from about \$400. Children cared for by aunt and uncle.
55684	Steam railroad,	Track laborer,	25	10 20	200 00	No dependents,	\$500,	No further information obtainable.

TABLE XIX. — Study Showing Condition of Dependents in Certain Uninsured Fatal Cases — Continued.

Report Number.	Industry.	Occupation.	Age.	Wage.	Amount Payable under Act in Analogous Cases.	Dependents.	Settlement.	Financial Condition.
58988	Steam railroad, . .	Coal shoveler, . .	50	\$14 23	\$1,067 25	Mother, . . .	No settlement yet, .	Settlement of \$200 offered but refused. Mother is supported by two sons who do not have steady work. Sister stays at home with mother who is feeble.
59982	Manufacture of cutlery, . .	Straightening on power drop, . .	52	12 00	1,800 00	Widow, . . .	\$1,850, . . .	Family in comfortable circumstances.
61499	Steam railroad, . .	Brakeman, . .	23	20 00	1,500 00	Mother, . . .	Case in hands of lawyer yet.	Mother ill as result of shock of son's death. Is supported now by her other son. Moderate circumstances.
62784	Steam railroad, . .	Helper, . .	34	10 50	787 50	Father, . . .	Claim in hands of lawyer.	No further information obtainable.
65028	Steam railroad, . .	Telegraph operator, . .	37	14 98	2,247 00	Widowed mother, . .	No settlement, .	Mother is now ill in hospital and has no means of support. Employee was only child.
66338	Steam railroad, . .	Section foreman, . .	55	17 20	2,580 00	Widow, . . .	\$750, . . .	No further information obtainable.
66595	Steam railroad, . .	Station porter, . .	46	10 80	1,620 00	Widow and one child under 18.	\$500 and burial expenses.	Widow is helped in maintaining home by daughters. In comfortable circumstances.
68030	Steam railroad, . .	Fire cleaner, . .	29	17 85	2,677 50	Widow and one child.	No settlement, .	Employee's family is in Russia. Wife is working to support herself and child.
67794	Steam railroad, . .	Freight brakeman, . .	47	15 00	2,250 00	Widow and four children.	No settlement, .	No further information obtainable.
72925	Steam railroad, . .	Yard brakeman, . .	52	21 00	3,000 00	Widow and two children.	No settlement yet. Case in lawyer's hands.	Family is in poor circumstances.
73654	Steam railroad, . .	Brakeman, . .	28	20 00	3,000 00	Widowed mother, . .	\$1,500, . . .	Employee was main support of mother who has had to break up home and now lives with married daughter who is not well situated financially.

74960	Building trades, .	Painter, . . .	32	24 00	3,000 00	Widow and one child.	No settlement, .	Widow and child dependent upon parents of widow.
76255	Steam railroad, .	Freight handler, .	25	12 00	200 00	No dependents, .	No settlement, .	No further information obtainable.
78763	Steam railroad, .	Brakeman, . .	30	21 00	3,000 00	Widow and one child.	\$1,000, . . .	Family in moderate circumstances.
78958	Steam railroad, .	Section laborer, .	47	10 80	1,020 00	One child, . . .	\$1,550, . . .	Child ten years of age will be cared for by aunt who has been appointed guardian.
79426	Domestic and personal service.	Chaufeur, . . .	36	10 00	1,500 00	Widow and one child.	No settlement, .	Widow works in a factory to support herself and child who is living with grandmother. Poor circumstances.
80526	Steam railroad, .	Car cleaning, . .	35	13 65	2,047 50	Widow and four children.	\$150, . . .	Widow is practically destitute. Oldest child is 7 years old, and youngest child is 6 months old. Family is in need.
82451	Steam railroad, .	Line foreman, . .	40	23 10	3,000 00	Widow and four children.	Suit pending, .	Widow was absolutely dependent upon employee's wages, and is practically destitute. Delay in settlement causes great hardship. Members of family in comfortable circumstances.
82703	Manufacture of gas, coke etc.	Foreman of coke crusher, . . .	48	15 00	200 00	No dependents, .	\$500, . . .	No further information obtainable.
44240	Steam railroad, .	Section laborer, .	29	10 20	765 00	Parents in Italy, .	\$275, . . .	No further information obtainable.
84706	Steam railroad, .	Freight conductor, .	38	35 00	1,500 00	Mother, . . .	\$350, . . .	Mother has pension of \$12 a month. Daughter who lives with her goes out working as a cleaner and helps support mother.
85646	Steam railroad, .	Freight conductor, .	35	18 00	1,350 00	Mother, . . .	\$250, . . .	Widow is a cripple and has to work to support herself and child. Cannot get steady work.
86244	Steam railroad, .	Fireman, . . .	32	23 40	3,000 00	Widow and one child.	\$500, . . .	Mother earns small wages and supports herself and little daughter. In poor circumstances.
86252	Telegraph company, .	Messenger, . . .	15	5 00	1,200 00	Mother and sister (9 years old), .	Suit pending, .	No further information obtainable.
86648	Steam railroad, .	Night watchman, .	45	15 00	2,250 00	Widow and two children.	No settlement, .	Employer offered a settlement of \$250 which was not accepted. Widow earns small amount to support herself and small child.
91538	Steam railroad, .	Watchman in ledges, .	54	13 14	2,016 00	Widow and one child.	No settlement yet, .	

TABLE XIX. — Study Showing Condition of Dependents in Certain Uninsured Fatal Cases — Concluded.

Report Number.	Industry.	Occupation.	Age.	Wage.	Amount Payable under Act in Analogous Cases.	Dependents.	Settlement.	Financial Condition.
92243	Steam railroad, . .	Wiper,	61	\$11 10	\$1,665 00	Widow, . . .	Case in hands of lawyer.	Settlement of \$500 refused by widow. Employee carried a small life insurance. Son and granddaughter live with widow. No further information obtainable.
93816	Steam railroad, . .	Headlight man, . .	61	12 67	1,900 50	Widow and one child (13 years old).	No settlement, .	
94341	Municipal corporation,	Janitor,	76	9 23	1,384 50	Widow and daughter.	No settlement, .	Widow and daughter, a semi-invalid, were dependent upon employee's wages. In very poor circumstances.
96084	Road building, . .	Teamster,	40	10 50	1,575 00	Widow and two small children.	Weekly payment of \$8 and \$600 insurance paid for by employer.	Widow has small house and \$600. Employer pays widow half of deceased employee's wages weekly, and "has been most kind,"
97247	Manufacture of gas, coke, etc.	Oilier,	36	14 00	1,050 00	Mother (an invalid),	\$700 and funeral expenses.	Mother has small house left by employee where she lives with a son who waits upon her. Another son helps to provide for her.
97863	Steam railroad, . .	Section man, . . .	25	9 60	1,440 00	Widow and one child.	No settlement, .	Widow and child are living in Turkey.
98421	Steam railroad, . .	Conductor,	56	27 00	3,000 00	Widow,	No settlement yet, .	Employer offered \$500 as settlement but not accepted. Widow keeps boarding house to provide for herself and young girl who lives with her.
8704	Steam railroad, . .	Helper,	25	10 50	787 50	Father,	No settlement yet. Case in attorney's hands.	Suit brought against company by administratrix of estate. Settlement offered by employer not accepted.
9033	Steam railroad, . .	Train baggagemaster, .	22	20 30	200 00	No dependents, .	No settlement, .	No further information obtainable.
42519	Sale of automobile supplies.	Errand boy,	14	5 00	1,200 00	Parents,	\$200,	Family is in poor circumstances.

TABLE XX. — *Personal Injuries by Diseases of Occupation, July 1, 1913, to June 30, 1914.*

CLASSIFICATION.	Industry.	CASES.			NON-FATAL CASES.		
		Non-fatal.	Total.	Fatal.	Total.	Days Lost.	Wages Lost.
<i>Harmful Substances.</i>	Arsenic,	1	1	—	12	12	\$19
	Dusts,	—	—	1	—	21	—
	Flour and grain mills,	1	1	—	365	42	954
	Foundries and metal working,	1	2	—	1	386	996
	Building and hand trades,	1	1	—	196	280	—
Gases, vapors and fumes,	Paint makers,	1	—	—	1	2	—
	Other chemical workers,	1	—	—	—	—	—
	Automobile factories,	1	—	—	—	85	151
	Other iron and steel workers,	1	—	—	6	12	—
	Printing and publishing establishments,	1	—	—	—	—	—
	Rubber factories,	1	—	—	31	53	—
	Construction and maintenance of streets, roads, sewers, etc.,	1	8	—	2	321	7
	Tanneries,	3	—	—	132	158	505
	Water transportation,	3	6	1	69	142	—
	Building and hand trades,	3	—	—	201	472	300
Hides (anthrax),	Paint makers,	1	—	—	175	35	—
	Glass makers, workers,	1	—	—	18	26	—
	Car and railroad shops,	3	—	—	96	56	—
	Foundries and metal working,	1	—	—	30	272	—
	Wagons and carriages,	1	—	—	49	30	—
	Jewelry factories,	1	—	—	67	145	—
	Printing and publishing establishments,	3	—	—	—	—	—
	Electrical supplies,	1	—	—	176	418	—
	Construction and maintenance of streets, roads, sewers, etc.,	1	—	—	42	63	—
	Street railways,	2	—	—	45	108	—
Mercury,	Wholesale and retail trade,	1	19	—	380	827	—
	Ship and boat building,	—	—	1	1,093	60	2,505

TABLE XX. — *Personal Injuries by Diseases of Occupation, etc.* — Continued.

CLASSIFICATION.	Industry.	CASES.			NON-FATAL CASES.		
		Non-fatal.	Total.	Fatal.	Total.	Wages Lost.	Total.
<i>Harmful Conditions.</i> Extreme cold,	Ice harvesting,	8				\$560	
	Building and hand trades,	4		1		447	
	Fertilizer makers,	2				232	
	Bakeries,	1				—	
	Fish curers and packers,	1				120	
	Flour and grain mills,	1				63	
	Slaughter and packing houses,	2				—	
	Sugar makers and refiners,	1				5	
	Foundries and metal working,	4				3	
	Ship and boat building,	1				10	
	Tanneries,	3				138	
	Breweries,	1		1		—	
	Box makers (wood),	1				26	
	Furniture,	2				8	
	Cotton mills,	3				106	
	Print works,	1				18	
	Woolen and worsted mills,	2				15	
	Electric light and power companies,	4				—	
	Gas works,	4				54	
	Water transportation,	6				203	
	Construction and maintenance of streets, roads, sewers, etc.,	15				345	
	Truck, transfer, cab and hack companies,	7				970	
	Street railways,	11				794	
	Steam railways,	4				238	
	Express companies,	1				112	
	Telegraph and telephone,	1				7	
	Wholesale and retail trade,	30				104	
	Warehouses and cold-storage plants,	3				975	
	Other persons in trade,	1				—	
	Professional service,	1	125		2	68	\$5,493
Extreme heat,	Fertilizer makers,	1				28	
	Bakeries,	3				6	
	Sugar makers and refiners,	1				39	
						10	

[illegible]

TABLE XX. — *Personal Injuries by Diseases of Occupation, etc.* — Concluded.

CLASSIFICATION.	Industry.	CASES.			NON-FATAL CASES.			
		Non-fatal.	Total.	Fatal.	Total.	Days Lost.	Wages Lost.	Total.
<i>Irritant Fluids and Substances — Con.</i>								
Hides,	Shoes,	3	15	—	—	16	\$26	—
	Tanneries,	12		—		45	71	\$97
Line,	Other iron and steel workers,	1		—		4	7	
	Harness and saddle makers and repairers,	1		—		7	13	
	Shoes,	1		—		4	5	
	Tanneries,	3	6	—		19	27	52
Oil,	Iron and steel mills,	1		—		—	—	—
	Other iron and steel workers,	5	6	—		45	93	93
Paint,	Building and hand trades,	2		—		84	205	—
	Electrical supplies,	2	4	—		7	16	221
Poisonous vines, trees, shrubs, etc.,	Building and hand trades,	1		—		32	96	—
	Foundries and metal working,	1		—		19	23	—
	Other liquor and beverage workers,	1		—		14	21	—
	Other woodworkers,	1		—		3	5	—
	Construction and maintenance of streets, roads, sewers, etc.,	2		—		44	71	—
	Real estate,	1	7	—		4	8	224
Raw wool,	Tanneries,	11	11	—		14	24	24
Washing and cleansing fluids,	Print works,	1		—		17	33	—
	Woolen and worsted mills,	3		—		136	178	—
	Banking and brokerage,	2	6	—		9	11	222
Local irritation from constant vibration, blows, pressure, etc.	Building and hand trades,	1		—		—	—	—
	Foundries and metal working,	2		—		75	299	—
	Other iron and steel workers,	4		—		176	342	—
	Shoes,	1		—		28	56	—
	Jewelry factories,	1		—		21	33	—
	Cotton mills,	1		—		5	6	—
	Gas works,	1		—		13	33	—

Other miscellaneous industries and occupations,	1	17	—	—	14	19
Street railways,	1	—	—	—	35	69
Steam railroads,	3	—	—	—	31	42
Laundries and laundry work,	1	17	—	—	25	43
Forestry,	1	—	—	—	—	—
Building and hand trades,	4	—	—	—	15	31
Other chemical workers,	3	—	—	—	52	91
Other food preparers,	1	—	—	—	28	48
Foundries and metal workers,	3	—	—	—	7	10
Other iron and steel workers,	3	—	—	—	74	104
Leather belt, leather case and pocketbook makers,	1	—	—	—	9	15
Shoes,	8	—	—	—	343	553
Tanneries,	1	—	—	—	—	—
Furniture,	2	—	—	—	27	79
Box makers (paper),	2	—	—	—	58	49
Printing and publishing establishments,	3	—	—	—	37	47
Electrical supplies,	4	—	—	—	9	22
Gas works,	1	—	—	—	77	154
Other miscellaneous industries and occupations,	1	—	—	—	—	—
Workers in "not specified" manufacturing and mechanical industries,	1	—	—	—	—	—
Wholesale and retail trade,	1	43	—	—	49	32
Occupations not in industries,	1	—	—	—	—	—
Totals,	—	354	—	10	8,134	\$15,582

